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ADDRESSES.

CONSIDERATIONS CONCERNING SOME EXTERNAL SOURCES OF INFECTION IN THEIR BEARING ON PREVENTIVE MEDICINE.

Being the Address on State Medicine delivered before the American Medical Association, in Newport, on June 28, 1889.

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No department of medicine has been cultivated in recent years with such zeal and with such fruitful results, as that relating to the causes of infectious diseases. The most important of these results for preventive medicine, and for the welfare of mankind is the knowledge that a large proportion of the causes of sickness and death are removable.

It is evident that efforts to preserve health will be most intelligently and effectually applied when they are based upon an accurate and full knowledge of the agencies which cause disease. Public and private hygiene, however, can not, and fortunately has not, waited for the full light of that day whose dawn has only begun to appear, when we shall have a clear insight into the causation of preventable diseases. Cleanliness and comfort demand that means shall be taken to render pure the ground on which we live, the air which we breathe, and the water and food with which we are supplied, and we must meet these needs without waiting to learn just what relation infectious agents bear to the earth, air, water and food.

It is a fortunate circumstance that modern sanitation has been controlled so largely by the belief in the dependence of endemic and epidemic diseases upon organic impurities in the soil and in the water. Incomplete and even erroneous in many respects, as are the views which have prevailed concerning the origin and spread of epidemic diseases by the decomposition of organic substances, the sanitary measures which have been directed toward the removal of filth have achieved great conquests in limiting the development and extension of many infectious diseases. The benefits which one Commonwealth of this country has derived from the intelligent employment of public sanitary measures were clearly and forcibly presented before this Association last year by Dr. Walcott in his admirable Address on State Medicine.

While nothing should be said, or need be said, to lessen the importance of cleanliness for public health, it is important to bear in mind, that hygienic cleanliness and æsthetic cleanliness are not identical. In water which meets the most severe chemical tests of purity typhoid bacilli have been found. On the other hand, the air in the Berlin sewers, which certainly does not meet the most modest demands of æsthetic cleanliness, has been found to be nearly or quite free from bacteria.

It needs only to be stated to be generally admitted that the scientific basis of preventive medicine must be the accurate knowledge of the causative agents of preventable diseases, a knowledge which can be derived only from a careful study of all of the properties of these agents, the modes of their reception and of their elimination by the body, the circumstances which favor, and those which retard or prevent their development and spread, their behavior in the various substances which surround us, or which we take into our bodies and the sources of infection, not only those which laboratory experiments show to be possible, but those which are actually operative.

So long as we were unacquainted with the living organisms causing infection, the means at our disposal for studying the etiology of infectious diseases were limited to the observation of all of the circumstances which we could determine regarding the origin and spread of these diseases. We could only infer what might be the properties of the infectious agents from the study of phenomena often obscure and difficult of interpretation. Chiefly by this method of investigation the science of epidemiology has been built up. It has established facts and laws no less of practical than of scientific importance. But it has left unsolved many problems, and has filled gaps with speculations. Admitted epidemiological facts are often open to various interpretations.

We are evidently at a great advantage when we can study the epidemiological facts with a knowledge of the substances which actually cause in-

fection, and this we are now enabled to do for a limited number of the infectious diseases. This new method of research, which thus far has been mainly bacteriological, has aided us not so much by simplifying the problems of etiology, which still remain complicated enough, as by affording greater accuracy to the results.

It is my aim in this address to consider some results of the modern studies of pathogenic microorganisms in their bearing upon preventive medicine, more particularly upon the sources of infection. It is, of course, impossible within the limits of the address, to attempt a complete survey of this important field. Time will permit the presentation of only some of the salient points.

Infectious diseases are those which are caused by the multiplication within the body of pathogenic microörganisms.

It has always been recognized that some infectious diseases, such as the exanthematous fevers, are conveyed directly from the sick to the healthy. It is not disputed that in these, evidently contagious diseases, the infectious germ is discharged from the body in a state capable at once of giving rise to infection.

In a second group of infectious diseases, of which malaria is the type, the infected individual neither transmits the disease to another person, nor, so far as we know, is capable of infecting a locality. Here there is a reason to believe that the infectious germ is not thrown off in a living state from the body, but is destroyed within the body. In this group the origin of infection under natural conditions is always outside of the body.

In a third group there is still dispute whether the disease can be transmitted directly from person to person, but all are agreed that the infected individual can infect a locality. It is especially fortunate that the bacteria which cause cholera and typhoid fever, the two most important representatives of this group of so-called miasmatic-contagious diseases, have been discovered and isolated in pure culture. These are the diseases about whose origin and epidemic extension there has been the greatest controversy. They, above all other diseases, have given the impulse to public sanitation during the last half century. The degree of success with which their extension in a community is prevented is an important gauge of the excellence of the local sanitary arrangements. A clear comprehension of the origin and spread of these diseases signifies the solution of many of the most vexed and important problems of epidemiology and of State hygiene.

It is difficult to understand how those who accept the discovery that the bacteria causing typhoid fever and cholera, have been found and cultivated from the stools of patients affected with these diseases, can doubt that these patients are possible sources of contagion, or can entertain the view once so widely prevalent that the infectious germs of these diseases are discharged from the body in a condition incapable of producing immediate infection. In an address delivered on another occasion, I have endeavored to present the consideration which reconcile the comparative infrequency of direct contagion for these diseases, with the belief in the elimination of the causative germs in an active state from the body, and have there pointed out several well known factors which determine the frequency of conveyance of an infectious disease by contagion. There are reasons, some of them very obvious, why diseases in which the infectious substances are operative only when received into the digestive tract, and are discharged usually only with the feces, are less likely to be transmitted by immediate contagion than those diseases in which the virus is thrown off from the skin on epidermal scales.

But the field of operation of direct contagion for these so-called miasmatic-contagious diseases is at most a restricted one, and the chief sources of infection are outside of the body from which primarily the infectious germs may have been derived. It is to these external sources of infection, which are of such importance in public hygiene, that I wish especially to direct attention.

A full comprehension of the sources of infection is, of course, to be obtained only by a detailed study of the etiology of the individual infectious diseases, but this is, of course, impossible within the limits of an address. It may, however, be useful to present some of the facts which have a general bearing upon the subject. Let us consider, then, from the point of view of modern bacteriological studies, what rôle in harboring or transporting infectious agents, may be played by those substances or media with which we necessarily come into intimate contact, such as the air, the ground, the water and our food.

It is universally admitted that many infectious agents may be transported by the air, but the extent of danger from this source has often been exaggerated. It is a popular error to suppose that most of the minute particles of dust in the air either are or contain living organisms. The methods for determining the number, and kind of bacteria and fungi in the air, are now fairly satisfactory, although by no means perfect. These have shown that while the number of living bacteria and fungi in the atmosphere, in and around human habitations cannot be considered small, still it is greatly inferior to that in the ground or in most waters. Unlike fungus spores, bacteria do not seem to occur to any extent in the air as single detached particles, which would then necessarily be extremely minute, but rather in clumps or attached to particles of dust of relatively large size. As a result in a perfectly quiet atmosphere, these comparatively heavy particles which contain bacteria, rapidly settle to the ground or upon

underlying objects, and are easily filtered out by passing the air through porous substances, such as cotton-wool or sand. Rain washes down a large number of bacteria from the air. That the air bacteria are derived from the ground or objects upon it is shown by their total absence, as a rule, from sea air at a distance from land, this distance naturally varying with the direction and strength of the wind.

A fact of capital importance in understanding the relations of bacteria to the air, and one of great significance for preventive medicine, is the impossibility of currents of air detaching bacteria from moist surfaces. Substances containing pathogenic bacteria, as, for instance, sputum containing tubercle bacilli or excreta holding typhoid bacilli, can not, therefore, infect the air unless these substances first become dry and converted into a fine powder. We are able to understand why the expired breath is free from bacteria and cannot convey infection, except as little particles may be mechanically detached by acts of coughing, sneezing or hawking. Those bacteria, the vitality of which is rapidly destroyed by complete desiccation, such as those of Asiatic cholera, evidently are not likely to be transported as infectious agents by the air, if we except such occasional occurrences as their conveyance for a short distance in spray.

The only pathogenic bacteria which hitherto have been found in the air, are the pus organisms, including the streptococcus, found by Prudden in a series of cases of diphtheria, and tubercle bacilli, but no far-reaching conclusions can be drawn from the failure to find other infectious organisms when we consider the imperfection of our methods, and the small number of observations directed to this point. The evidence in other ways is conclusive that many infectious agents—and here the malarial germ should be prominently mentioned—can be, and often are, conveyed by the air. While we are inclined to restrict within narrower limits than has been customary the danger of infection through the air, we must recognize that this still remains an important source of infection for many diseases. All those, however, who have worked practically with the cultivation of microörganisms, have come to regard contact with infected substances as more dangerous than exposure to the air, and the same lesson may be learned from the methods which modern surgeons have found best adapted to prevent the infection of wounds with the cosmopolitan bacteria, which cause suppuration.

We are not, of course, to suppose that infectious germs floating in the form of dust in the atmosphere are dangerous, only from the possibility of our drawing them in with the breath. Such germs may be deposited on substances with which we readily come into contact, or they may fall on articles of food where they may find conditions suitable for their reproduction, which cannot occur when they are suspended in the air in consequence of the lack of moisture.

From the facts which have been mentioned concerning the relations of bacteria to the air, what points of view present themselves to guide us in preventing infection through this channel? Surely something more than that this purpose is accomplished simply by abolishing foul odors.

Certain indications are so plain as to need only to be mentioned in this connection, such as the disinfection and removal, as far as possible, of all infected substances, an indication which applies equally to all channels of infection, and which it is much easier to mention than it is to describe how it shall be realized. But there are two indications which apply especially to the prevention of the transportation of disease germs by the air. One is the necessity of guarding, so far as practicable, against the desiccation, when exposed to the air, of substances which contain infectious germs not destroyed by drying, and another is free ventilation.

For no disease is the importance of the first of these indications so evident and so well established as for tuberculosis, the most devastating of all infectious diseases. Against this disease, formidable as it may seem to cope with it, the courageous crusade of preventive medicine has begun, and is destined to continue.

It is now generally recognized that the principal, although not the sole, sources of tuberculous infection are the sputum of individuals affected with pulmonary tuberculosis and the milk of tuberculous cows. Cornet, who has made a laborious and most instructive experimental study of the modes and dangers of infection from tuberculous sputum, has also elaborated the practical measures which should be adopted to diminish or annihilate these dangers. These measures have been so recently and so widely published in medical journals, and so clearly presented before a Section of this Association, that I mention them only to call the attention of practitioners of medicine to their importance, and to emphasize the fact that they are based chiefly upon the principle that infectious substances of such nature as tuberculous sputum should not be allowed to become dry and converted into dust when exposed to the air.

By means of free ventilation, disease-producing microörganisms which may be present in the air of rooms, are carried away and distributed so far apart that the chance of infection from this source is removed or reduced to a minimum. It is a well-established clinical observation that the distance through which the specific microbes of such diseases as small-pox or scarlatina are likely to be carried from the patient by the air, in such concentration as to cause infection, is small, usually not more than a few feet, but increases by

crowding of patients and absence of free ventilation. The well-known experiences in the prophylaxis and treatment of typhus fever are a forcible illustration of the value of free ventilation.

It is, of course, not to be understood that by ventilation we accomplish the disinfection of a house or apartment. Ventilation is only an adjunct of such disinfection which, as already mentioned, is of first importance. Time will not permit, nor is it in the plan of this address, to discuss the details of such questions as house disinfection, but I may be permitted to say that the methods for disinfecting apartments have been worked out on a satisfactory experimental basis, and should be known, at least, by all public health officers. Whether it be pertinent to this occasion or not, I cannot forbear to add my protest to that of others against placing reliance upon any method hitherto employed of disinfecting houses or apartments by fumigation. And I would, furthermore, call attention to the lack in most cities of this country of public disinfecting establishments, such as are in use with excellent results in many cities of Europe, and which are indispensable for the thorough and convenient disinfection of clothing, bedding, carpets, curtains, etc.

After this short digression let us pass from the consideration of the air as a carrier of infection to another important external source of infection, namely, the ground. That the prevalence of many infectious diseases depends upon conditions pertaining to the soil cannot be questioned, but the nature and the extent of this influence have been and are the subjects of lively discussion. The epidemiological school led by Pettenkofer, assigns as is well-known, to the ground the chief, and even a specific and indispensable influence in the spread of many epidemic diseases, particularly cholera and typhoid fever. The statistics, studies and speculations of epidemiologists which have related to this subject, probably surpass in number and extent those concerning any other epidemiological factor. The exclusive ground hypothesis has become an ingenious and carefully elaborated doctrine with those who believe that such diseases as cholera and typhoid fever can never be transmitted by contagion. These authorities cling to this doctrine with a tenacity which indicates that on it depends the survival of the exclusively localistic dogma for these diseases.

To all who have not held aloof from modern bacteriological investigations, it must be clear that views which have widely prevailed concerning the relations of many infectious germs to the soil require revision. The question is still a difficult and perplexing one, but on some hitherto obscure or misunderstood points these investigations have shed light, and from the same source we may expect further important contributions to a comprehension of the relations of the ground to the development of infectious diseases.

The ground, unlike the air, is the resting or the breeding place of a vast number of species of microörganisms, including some which are pathogenic. Instead of a few bacteria or fungi in a liter as with the air, we find in most specimens of earth thousands, and often hundreds of thousands of microörganisms in a cubic centimeter. Fraenkel found the virgin soil almost as rich in bacteria and fungi as that around human habitations.

This vast richness in microörganisms belongs, however, only to the superficial layers of the earth. Where the ground has not been greatly disturbed by human hands, there is, as a rule, about three to five feet below the surface an abrupt diminution in the number of living organisms, and at the depth where the sub-soil water usually lies, bacteria and fungi have nearly or entirely disappeared. Fraenkel, who first observed this sudden diminution in the number of microorganisms at a certain level beneath the surface, explains this singular fact by the formation at this level of that sticky accumulation of fine particles consisting largely of bacteria which forms the efficient layer in large sand filters for water. Of course the number of bacteria, and the depth to which they penetrate, will vary somewhat with the character, especially the porosity of the soil and its treatment, but the important fact that all, or nearly all of the bacteria and fungi are retained in the ground above the level of the sub-soil water, will doubtless hold true for most situations.

The conditions are not favorable for the multiplication of bacteria in the depth of the ground, as is shown by the fact that in specimens of earth brought to the surface from a depth of a few feet, the bacteria which are at first present, rapidly multiply. What all of the conditions are which prevent the reproduction of bacteria in the deep soil has not been ascertained, but the fact necessitates similar precautions in the bacteriological examination of the soil as in that of water.

We have but meagre information as to the kinds of bacteria present in the ground in comparison with their vast number. Many of those which have been isolated and studied in pure culture possess but little interest for us so far as we know. To some of the microörganisms in the soil appears to be assigned the rôle of reducing or of oxidizing highly organized substances to the simple forms required for the nutrition of plants. We are in the habit of considering so much the injurious bacteria that it is pleasant to contemplate this beneficent function, so essential to the preservation of life on this globe.

Among the pathogenic bacteria which have their natural home in the soil the most widely distributed are the bacilli of malignant œdema and those of tetanus. I have found some garden earth in Baltimore extremely rich in tetanus bacilli, so that the inoculation of animals in the

laboratory with small bits of this earth rarely fails to produce tetanus. In infected localities the anthrax bacillus and in two instances the typhoid bacillus, so far as it was possible to identify it, have been discovered in the earth. There is reason to believe that other germs infectious to human beings may have their abiding place in the ground; certainly no one doubts that the malarial germ lives there. As the malarial germ has been shown to be an organism entirely different from the bacteria and the fungi, we cannot apply directly to its behavior in the soil and its transportation by the air, facts which have been ascertained only for the latter species of microörganisms, and the same precautions must be observed for other diseases with whose agents of infection we are not acquainted, as, for instance, yellow fever.

In view of the facility with which infectious germs derived from human beings or animals may gain access to the soil, it becomes a matter of great importance to determine how far such germs find in the soil conditions favorable for their preservation or their growth. We have, as is well known, a number of epidemiological observations bearing upon this subject, but with few exceptions these can be variously interpreted, and it is not my purpose to discuss them. The more exact bacteriological methods can, of course, be applied only to the comparatively small number of infectious diseases the causative germs of which have been isolated and cultivated, and these methods hitherto have been applied to this question only imperfectly. We cannot regard the soil as a definite and unvarying substance in its chemical, physical and biological properties. What has been found true of one kind of soil may not be so of another. Moreover, we cannot in our experiments bring together all of the conditions in nature which may have a bearing on the behavior of specific microörganisms in the soil. We must, therefore, be cautious in coming to positive conclusions on this point on the basis of experiments, especially those with negative result. With these cautions kept constantly in mind the question, however, is one eminently open to experimental study.

The experiments which have thus far been made to determine the behavior of infectious microörganisms in the ground have related especially to the bacilli of anthrax, of typhoid fever and of cholera, and, fortunately, these are the diseases about whose relations to the ground there has been the most discussion, and concerning which we are most eager to acquire definite information.

As regards anthrax bacilli, it has been determined that in ordinary garden or field earth they do not multiply, but in earth contaminated by blood, urine or fæces their reproduction can occur. They can grow on various vegetable substrata. There is no reason to doubt, therefore, that the anthrax bacilli can find in or on the ground suitable conditions for their multiplication, although such conditions are not everywhere present. For durable infection of the soil with anthrax bacilli it is, however, more important that these bacilli should find there suitable conditions for the formation of spores, than that they should be able simply to multiply. The vegetable forms of anthrax bacilli would not, as a rule, be able to survive for any great length of time the hostile influences which they are likely to encounter in the ground, such as insufficient or exhausted nutriment, absence of sufficient moisture and the attacks of saprophytic organisms. On the other hand, against these injurious influences the anthrax spores have great resistance. In the superficial layers of the ground the anthrax bacilli may often find those conditions of moisture, of temperature, of oxygen supply and of insufficient food which we know are most favorable for the development of their spores; indeed, Soyka has shown that the ground presents often these conditions better than our culture media. A circumstance discovered by Feltz, which, however, needs confirmation, is, if true, of not little significance. He finds that anthrax bacilli may undergo a progressive diminution in virulence in the soil. It this should be true likewise of other infectious microörganisms, we should be able to account in some instances for the variable degree of virulence which clinical observation indicates that certain agents of infection acquire. So far as anthrax bacilli are concerned, we may conclude, therefore, that the ground occasionally offers suitable conditions for their reproduction, but what is of greater importance, it offers especially favorable conditions for their long-continued preservation in the form of spores. I must forego here the further consideration of the special circumstances inherent in the soil which control the origin and spread of epidemics of anthrax in cattle, although many interesting investigations have been directed to this subject.

Of greater interest to physicians is the behavior of typhoid and of cholera bacteria in the ground. As has already been intimated, the ground is regarded by Pettenkofer and his school as the principal breeding-place of these microörganisms outside of the body. This view, however, is not supported by bacteriological investigations. Inasmuch as the cholera and typhoid bacilli may multiply on various vegetable substrata and substances derived from animals at temperatures often present in the ground, it is evident that here and there conditions may be present for their growth in the ground, but this growth is likely to be soon interrupted by the invasion of ordinary saprophytic organisms and other harmful influences. The typhoid bacilli are more hardy in resisting these invaders than are the cholera bacteria, which easily succumb, but even for the former, so far as our present knowledge extends, the ground can rarely serve as a favorable breeding-place.

It is not, however, necessary that these organisms should multiply in order to infect for a considerable time the ground; it is sufficient if their vitality is preserved. As to this latter point, the reports of different investigators are not altogether concordant. Such excellent observers as Koch, Kitasato and Uffelmann found that the cholera bacteria, when added to fæces or a mixture of fæces and urine, rapidly diminished in number and, at the end of three or four days at the most, had wholly disappeared. In a mixture of the intestinal contents from a cholera corpse with earth and water Koch found numerous cholera bacteria at the end of three days, but none at the end of five days. On the other hand, Gruber reports the detection of cholera bacteria in cholera dejecta fifteen days old. The weight of bacteriological evidence, therefore, is opposed to the supposition that the bacteria of Asiatic cholera preserve their vitality for any considerable time in the ground or in the excreta.

With respect to the bacilli which cause typhoid fever, it has been shown by Uffelmann that these may live in fæces, mixture of fæces and urine, and mixture of garden earth, fæces and urine for at least four and five months, and doubtless longer, although they may die at the end of a shorter period. He also finds that, under these apparently unfavorable conditions, some multiplication of the bacilli may occur, although not to any considerable extent. Grancher and Deschamps found that typhoid bacilli may live in the soil for at least five months and a half. Unlike the cholera bacteria, therefore, the typhoid bacilli may exist for months at least in the ground and in fæcal matter, holding their own against the growth of multitudes of saprophytes. This difference in the behavior of cholera and of typhoid germs is in harmony with clinical experience.

As regards other infectious bacteria than those which have been considered I shall only mention that tubercle bacilli, although incapable of multiplication under the ordinary conditions of nature outside of the body, may preserve their vitality for a long period in the ground, on account of their resistant character; and furthermore, that the pyogenic cocci, on account of their considerably resistant nature and their modest demands in the way of nutriment, can be preserved and sometimes, probably, grow in the ground. Indeed, the staphylococcus pyogenes aureus has been found in the earth by Lübbert.

The conclusion which we may draw from the observations mentioned is that, in general, the soil is not a good breeding-place for most of the infectious bacteria with which we are acquainted, but that it can retain for a long time with unimpaired vitality those which produce spores or which offer considerable resistance to injurious agencies, such as anthrax bacilli, typhoid bacilli, tubercle bacilli and the pyogenic cocci.

In order to become infected with bacteria in or on the ground these bacteria must in some way be introduced into the body; and we must, therefore, now attempt to determine how bacteria may be transported to us from the ground. So various and intricate are the possibilities for this transportation that it is hopeless to attempt to specify them all.

There occurs to us first the possibility of the conveyance of infectious microörganisms from the soil by means of currents of air, a mode of carrying infection which has already been considered. Here I shall only repeat that the wind can remove bacteria from the ground only when the surface is dry and presents particles of dust, and that the sole, and perhaps the chief, danger is not that we may inhale the infected dust.

Manifold are the ways in which we may be brought into contact with infectious bacteria in the ground, either directly or by means of vegetables to which particles of earth are attached, by the intervention of domestic animals, by the medium of flies or other insects, and in a variety of other ways, more or less apparent.

An important, doubtless for some diseases the most important, medium of transportation of bacteria from an infected soil is the water which we drink or use for domestic purposes. From what has been said it is evidently not the subsoil water which is dangerous, for infectious like other bacteria cannot generally reach this in a living state, but the danger is from the surface water and from that which trickles through the upper layers of the ground, as well as from that which escapes from defective drains, gutters, cesspools, privy vaults and wrongly constructed sewers or improper disposal of sewage. I shall have something to say presently of water as a source of infection and shall not further elaborate here the dangers of infection of drinking-water through contaminated soil, dangers which, especially as regards typhoid fever, are widely appreciated in this country, even if often imperfectly counteracted.

A point which has been much discussed, and one of interest, is whether bacteria which are in the depths of the ground can come to the surface. Two agencies especially have been considered by some as capable of transporting bacteria from the depth to the surface. One is ascending currents of air in the ground and the other is the capillarity of fluids in the minute pores of the ground. The first of these suspected agencies must be unquestionably rejected in view of the fact that even a few inches of sand is sufficient to filter all of the bacteria out of the air, even when it is in much more rapid motion than can occur within the ground. Moreover, that degree of dryness which is essential for the detachment of bacteria by air-currents is not likely to be present much below the surface of the ground. The experiments

which have been made to determine to what extent bacteria may be carried upward by the capillarity of fluids in the ground have not yielded harmonious results, but the weight of evidence is opposed to the belief that this is a factor of any considerable importance for this purpose.

From what has been said concerning the growth of pathogenic bacteria in the soil we shall not be inclined to attribute to the multiplication and the motility of these organisms much influence in changing their place in the ground.

The somewhat sensational rôle assigned by Pasteur to earth worms of bringing bacteria to the surface cannot be wholly ignored and has received support from observations of Bollinger regarding anthrax, but it is questionable whether much importance is to be attached to this agency.

Regarding the depth to which typhoid bacilli may penetrate in the soil, the experiments of Grancher and Deschamps show that at the end of five weeks they may reach a depth of 16 to 20 inches below the surface. As Hoffmann has demonstrated the extraordinary slowness with which fluids and fine particles penetrate the soil, it is probable that in the course of time a greater depth than this may be reached. Indeed, Macé claims to have found in the neighborhood of a wall, suspected of infection, typhoid bacilli, together with ordinary intestinal bacteria, at a depth of at least 6½ feet below the surface. There are a number of instances recorded in which there is good reason to believe that turning up the soil and cleaning out privies or dung-heaps in which typhoid stools have been thrown, have given rise to typhoid fever, even after the infectious excreta have remained there a year and more.

It cannot be said that bacteriological investigations have as yet shed much light upon a factor which plays a great rôle in epidemiology, namely, predisposition to infection from the ground, according to locality and time, and this deficiency receives constant and vehement emphasis from the localistic school of epidemiologists. We can, however, readily understand that varying conditions, such as temperature, moisture, porosity, quality of soil may exert a controlling influence in determining the behavior of infectious germs in the soil and the facility of their transportation to human beings or animals. As regards that much-discussed question, the significance of variations in the height of the subsoil water, in relation to the prevalence of certain epidemic diseases, particularly cholera and typhoid fever, we now know that this cannot depend upon the presence of bacteria in the subsoil water itself or in the capillary layers immediately above it. It has been plausibly suggested that with the sinking of the subsoil water fluids from infected cesspools, privy vaults, and other localities may more readily be drawn into wells or other sources of water-supply, and that by the same cause the surface of the ground becomes dry, so that dust particles may be lifted by the wind. Other more or less plausible explanations have also been offered, but it must be confessed that our positive information on this point is meagre. There can, however, be little doubt that this significance of the variations in subsoil water is apparent only for certain localities and has been considerably exaggerated and often misunderstood. It is not, however, pertinent to my theme to discuss this or other purely epidemiological observations concerning the relations of the ground to the spread of epidemic diseases, interesting and important as are many of these observations.

Before leaving the subject of the ground as a source of infection, permit me to indicate briefly some conclusions which may be drawn from what has been said as to the principles which should guide us in preventing infection directly or indirectly from the ground.

First in importance is to keep infectious substances, so far as possible, from the ground. This implies the early disinfection or destruction of such substances as typhoid and cholera excreta and tuberculous sputum.

Second. The ground should be rendered, so far as practicable, unsuitable for the continued existence of infectious germs. This, at least for some diseases, is accomplished by a proper system of drainage, which, moreover, for other reasons possesses hygienic importance.

Third. Means should be provided to prevent waste products from getting into the ground around human habitations or from gaining access to water used for drinking or domestic purposes. In cities this can be accomplished only by a properly constructed system of sewers. The system of storing waste products in cesspools, whence they are to be occasionally removed cannot be approved on hygienic grounds. There are conditions in which the disposal of waste products in deep wells only used for this purpose and whence these products can filter into the deep layers of the ground may be permissible, but this can never be considered an ideal method of getting rid of excrementitious substances and is wholly wrong in regions where wells are used for drinking water. But I am trespassing with these remarks upon a province which does not belong to me, but rather to practical sanitarians and engineers. I shall only add that the advantage gained by preventing organic waste from soaking into the ground is not so much that the ground is thereby rendered better adapted for the existence of infectious microörganisms, but is due rather to the fact that this waste is likely to contain infectious germs.

Finally, in cities good pavements, absence of unnecessary disturbance of the soil, cleanliness of the streets and laying of the dust by sprinkling are not only conducive to comfort but are some-

times hygienically important in preventing infection from the ground and dust.

In passing from the consideration of the ground to that of water one feels that he now has to do with a possible source of infection against which in this country and in England he is at liberty to make any accusation he chooses without fear of contradiction. There is reason to believe that such accusation has been repeatedly made without any proof of misdemeanor on the part of the water. It is not, therefore, with any desire to awaken further the medical or public conscience that I wish to say a few words concerning the behavior of bacteria in water and the dangers of infection from this source. That such dangers are very real must be apparent when we consider the universal employment of water and its exposure to contamination from all kinds of sources.

Ordinary water, as is well known, contains bacteria in large number. Not a few species of bacteria can multiply rapidly and to a large amount even in distilled water. These are so-called water-bacteria, and like most of the microorganisms found in ordinary drinking water are perfectly harmless saprophytes. What we wish to know is, how pathogenic microörganisms conduct themselves in water. Can they grow or be preserved for any length of time in a living condition in water? As regards the multiplication of pathogenic bacteria in water the results of different experimenters do not altogether agree. Whereas Bolton failed to find any growth, but rather a progressive diminution in number of pathogenic bacteria planted in sterilized water, Wolffhügel and Riedel observed a limited reproduction of such bacteria, including those of typhoid fever and of cholera. This difference is due probably to the methods of experimentation employed. According to Kraus, these latter bacteria diminish rapidly in number in unsterilized spring or well water kept at a low temperature. These experiments indicate that water, even when contaminated with more organic impurities than are likely ever to be present in drinking water, is not a favorable breeding place for pathogenic bacteria. Still it is to be remembered that these laboratory experiments do not reproduce exactly all of the conditions in nature, and it may happen that in some nook or cranny or vegetable deposit at the side of a well or stream some pathogenic bacteria may find suitable conditions for their multiplication.

But, as has been repeatedly emphasized in this address, it is not necessary that pathogenic bacteria should actually multiply in a medium in order to render it infectious. It is sufficient if their life and virulence are not destroyed in a very short time. As to this important point, Bolton found that in sterilized water typhoid bacilli may preserve their vitality for over three months and cholera bacteria for eight to fourteen days, while Wolffhügel and Riedel preserved the latter in water for about eighty days. Under natural conditions, however, these organisms are exposed to the overgrowth of the water bacteria, so that Kraus found in unsterilized water kept at a temperature of 10.5° C. the typhoid bacilli no longer demonstrable after seven days, and the cholera bacteria after two days. The conditions in Kraus's experiments were as unfavorable as possible for the continued existence of these pathogenic bacteria, more unfavorable than those often present at the season of prevalence of cholera and typhoid fever, neverthless I do not see that they justify the conclusions of Kraus as to the slight probability of drinking water ever conveying infection with the germs of typhoid fever and of cholera. To render such a conclusion probable it would be necessary to demonstrate a much shorter preservation than even Kraus himself found. In judging this question it should not be overlooked that infection of drinking water with the typhoid or the cholera germs is not so often the result of throwing typhoid or cholera stools directly into the source of water-supply as it is the consequence of leaky drains, cesspools, privy-vaults or infected soil, so that there may be continued or repeated accessions of infected material to the water.

In view of the facts presented, there is no sufficient reason, therefore, from a bacteriological point of view, of rejecting the transmissibility of typhoid fever and cholera by the medium of drinking water. This conclusion seems irresistible when we call to mind that Koch once found the cholera bacteria in large number in the water of a tank in India, and that the typhoid bacilli have been repeatedly found in drinking water of localities where typhoid fever existed. Nor do I see how it is possible to interpret certain epidemiological facts in any other way than by assuming that these diseases can be contracted from infected drinking water, although I know that there are still high authorities who obstinately refuse to accept this interpretation of the facts.

In this connection it may be mentioned that pathogenic bacteria may preserve their vitality longer in ice than in unsterilized drinking water. Thus Prudden found typhoid bacilli still alive which had been contained in ice 103 days.

When we come to consider the ways in which water may become infected with pathogenic microörganisms we recognize at once a distinction in this respect between surface water and subsoil water. Whereas the subsoil water may be regarded under ordinary circumstances and in most places as germ-free, the surface water, such as that in rivers and streams, is exposed to all manner of infection from the ground, the air, and the direct admission of waste substances. Unfortunately in the ordinary way of obtaining subsoil water for drinking purposes by means of dug wells this distinction is obliterated, for the water

which enters these wells free from bacteria is converted into a surface water often exposed, by the situation of the well, to more dangerous contamination than other surface waters used for drinking purposes.

Now let us turn our attention, as we have done with other sources of infection, to a brief outline of certain general principles which may help us in avoiding infection from the water.

We shall in the first place avoid so far as possible the use of water suspected of infection, especially with the germs of such diseases as typhoid fever and cholera. When it is necessary to use this suspected water it should be boiled.

As regards the vital question of water-supply, it may be stated as a general principle that no hygienic guarantee can be given for the purity of surface water which has not been subjected to a proper system of filtration, or for the purity of spring or well water fed from the subsoil, unless such water is protected from the possibility of infection through the upper layers of the soil or from the air. This is not saying that water which meets certain chemical and biological tests and which is so situated that the opportunities for its contamination appear to be absent or reduced to a minimum is not admissible for the supply of drinking water, but the possibility of infection can be removed only by the fulfillment of the conditions just named, and upon these conditions the hygienic purist will always insist.

Unfortunately we have at present no domestic filters which are satisfactory, and most of those in common use are worse than none, as they soon furnish a filtrate richer in bacteria than the original water. The only effective method of water-filtration for the general supply is by means of large sand filters, such as are in use with excellent results in Berlin and some other cities. These require skilled attention. I cannot on this occasion discuss the construction or working of these filters, but would refer those who are interested to the full and careful investigation of the Berlin filters by Wolffhügel and by Plagge and Proskauer.

What is accomplished by these artificial sand filters is accomplished under natural conditions, also by the ground, which furnishes a subsoil water free from microörganisms, and to obtain pure water we have only to devise means by which this subsoil water may be secured without the chance of contamination. Just as the water which has passed through the sand filters is collected in suitable reservoirs and is distributed in pipes, which do no not admit contamination from without, so by means of properly constructed artesian or driven wells we may secure the naturally filtered subsoil water with the same freedom from the chances of infection.

It is well to bear in mind that no biological or chemical tests of water can replace those measures which have been mentioned as necessary to secure purity of water-supply. These tests are of value only when applied with proper precautions and with due consideration of the special circumstances of each case for which they are employed. There has been much profitless discussion as to whether greater significance is to be attached to the chemical or to the bacteriological examination of water. Each has its own special field of application and in this the one cannot replace the other method. The bacteriological examination has for hygienic purposes the advantage that it may enable us to detect the specific agents of infection in the form of microörganisms, as has already been done for cholera bacteria and typhoid bacilli, but this is a comparatively rare result and does not at present afford a wide field of application for this method. The significance of the bacteriological test is to be based more frequently upon the fact that it concerns itself with the same class of microörganisms to which some of the recognized and doubtless many of the undiscovered infectious agents belong and from the behavior of which in some respects conclusions can be drawn as to the behavior of the pathogenic organisms. Thus the bacteriological test is the only one which enables us to judge correctly of the efficacy of those methods of filtration of surface water and of construction of wells which insure purity of water-supply. The points of view from which we can estimate correctly according to our present knowledge the relative merits and fields of application of the chemical and of the bacteriological methods of water examination have been clearly indicated by Plagge and Proskauer, and by Wolffhügel. The theme is one beyond the limits or the scope of this discourse and I have referred to it chiefly to emphasize the fact that we cannot rely upon chemical or bacteriological tests of water to the exclusion of those protective measures which have been mentioned, although I do not intend to imply that each of these tests when properly employed does not afford important information and is not of great value in many cases.

I have already taxed so largely your time and patience that I must pass over with brief mention the food as a source of infection. Unlike those external sources of infection which we have hitherto considered, many articles of food afford an excellent nutritive medium for the growth of a number of species of pathogenic microörganisms, and in many instances this growth may be abundant without appreciable change in the appearance or taste of the food.

When we consider in how large degree the certainty and the severity of infection with many kinds of pathogenic microörgaisms depend upon the number of such organisms received into the body, we can appreciate that the danger of infection from food which contains a mass of growing

pathogenic bacteria may be much greater than that resulting from the reception of infected water or aid, media in which infectious organisms are rarely present in other than a very dilute condition. The entrance into the body of a single infections bacterium with the inspired air is, at least in the case of many diseases, not likely to cause infection, but let this bacterium fall upon some article of food, as for instance upon milk, where it can multiply in a short time at a favorable temperature many thousand-fold and evidently the chances of infection become vastly increased.

Among the various agencies by which infectious organisms may gain access to the food may be mentioned the deposition of dust conveyed by the air, earth adhering to vegetables, water used in mixing with or in the preparation of food, in cleansing dishes, clothes, etc., and contact in manifold other ways with infected substances.

Fortunately a very large part of our food is sterilized in the process of cooking shortly before it is partaken, so that the dangers of infection from this source is greatly diminished and comes into consideration only for uncooked or partly cooked food and for food which, altnough it may have been thoroughly sterilized by heat, is allowed to stand a considerable time before it is used. Milk, in consequence of its extensive employment in an unsterilized state and of the excellent nutritive conditions which it presents to many pathogenic bacteria, should be emphasized as especially liable to convey certain kinds of infection; a fact supported not less by bacteriological than by clinical observations. Hesse found that also a large number of ordinary articles of food prepared in the kitchen in the usual way for the table and then sterilized afford a good medium for the growth and preservation of typhoid and cholera bacteria, frequently without appreciable change in the appearance of food.

Upon solid articles of food bacteria may multiply in separate colonies, so that it may readily happen that only one or two of those who partake of the food eat the infected part, whereas with infected liquids, such as milk, the infection is more likely to be transmitted to a larger number of those who are exposed.

In another important particular the food differs from the other sources of infection which we have considered. Not only the growth of infectious bacteria, but also that of bacteria incapable of multiplication within the body may give rise in milk and other kinds of food to various ptomaines, products of fermentation and other injurious substances which when injested are likely to cause more or less severe intoxication or to render the alimentary tract more susceptible to the invasion and multiplication of genuinely infectious organisms.

It is plain that the liability to infection from food will vary according to locality and season. In some places and among some races the proportions of uncooked food used is much greater than in other places and among other races. In general in summer and in autumn the quantity of fruit and food ingested in the raw state is greater than at other seasons, and during the summer and autumn there is also greater danger from the transportation of disease germs from the ground in the form of dust, and the amount of liquids imbibed is greater. The elements of predisposition according to place and time upon which epidemiologists are so fond of laying stress are not therefore absent from the source of infection now under consideration.

I have thus far spoken only of the secondary infection of food by pathogenic microörganisms, but as is well known the substances used for food may be primarily infected. Chief in importance in the latter category are the various entozoa and other parasites which infect animals slaughtered for food. The dangers to mankind resulting from the diseases of animals form a separate theme, which would require more time and space than this address affords for their proper consideration. I shall content myself on this occasion with only a brief reference to infections from the milk and flesh of tuberculous cattle.

It has been abundantly demonstrated by numerous experiments that the milk from tuberculous cows is capable when ingested of causing tuberculosis. How serious is this danger may be seen from the statistics of Bollinger, who found with cows affected with extensive tuberculosis the milk infections in 80 per cent. of the cases, in cows with moderate tuberculosis the milk infections in 66 per cent. of the cases, and in cows with only slight tuberculosis the milk infections in 33 per cent of the cases. Dilution of the infected milk with other milk or with water diminished or in sufficient degree it removed the danger of infection. Bollinger estimates that at least 5 per cent. of the cows are tuberculous. From statistics furnished me by Mr. A.W. Clement, V. S., it appears that the number of tuberculous cows in Baltimore which are slaughtered is not less than 3 to 4 per cent. Among some breeds of cattle tuberculosis is known to be much more prevalent than this.

There is no evidence that the meat of tuberculous cattle contains tubercle bacilli in sufficient numbers to convey infection, unless it be very exceptionally. Nevertheless one will not willingly consume meat from an animal known to be tuberculous. This instinctive repugnance, as well as the possibility of post-mortem inspection of the meat in dressing the animal seem good grounds for discarding such meat. The question, however, as to the rejection of meat of tuberculous animals has important economic bearings and has not been entirely settled. As to the rejection of the milk from such animals, however, there can be no difference of

opinion, although this is a point not easily controlled.

The practical measures to adopt in order to avoid infection from the food are for the most part sufficiently obvious. Still it is not to be expected that every possibility of infection from this source will be avoided. It is difficult to discuss the matters considered in this address without seeming to pose as an alarmist. But it is the superficial and half knowledge of these subjects which is most likely to exaggerate the dangers. While one will not under ordinary circumstances refrain from eating raw fruit or food which has not been thoroughly sterilized, or from using unboiled or natural waters in the fear that he may swallow typhoid or cholera bacteria, still in a locality infected with cholera or typhoid fever he will, if wise, not allow himself the same freedom in these respects. Cow's milk, unless its source can be carefully controlled, should, when used as a habitual article of diet, as with infants, be boiled, or the mixed milk of a number of cows should be selected, but this latter precaution offers less protection than the former.

In most places in this country we are sadly lacking in good sanitary inspection of the food, especially of the animal food, offered for sale. One cannot visit the slaughter-house in Berlin or Munich, and doubtless similar ones are to be found elsewhere, and watch the intelligent and skilled inspection of slaughtered animals without being impressed with our deficiency in this respect. In large cities an essential condition for the efficient sanitary inspection of animal food is that there should be only a few places, and preferably only one place, where animals are permitted to be slaughtered. Skilled veterinarians should be selected for much of the work of inspection.

It may reasonably be asked that the National Government, which has already spent so much money for the study and extermination of such diseases as pleuro-pneumonia, of cattle, and hog cholera, which are not known to endanger the life of human beings, should turn its energies also to means for eradicating tuberculosis from cattle, which is a scourge not only to the economic interests of farmers and dairymen, but also to the health of human beings.

Without any pretension to having done more in this address than to sketch here and there a few principles derived from bacteriological researches concerning only some of the most widely distributed external sources of infection, I trust that enough has been said to show the folly of any exclusive dogma as to modes of infection. The ways of infection, even in one and the same disease, are manifold and various, and can never be resolved into exclusive hypotheses, such as the drinking-water hypothesis, the ground hypothesis, etc.

It follows, therefore, that it is not by sanitary improvements in one direction only that we can control the spread of preventable epidemic diseases. In one situation the improvements in the supply of drinking water check the prevalence of typhoid fever, in another place similar measures show no such influence; or again, in one city the introduction of a good system of sewerage diminishes epidemic diseases, and in another no similar result follows. We should, therefore, aim to secure so far as possible good sanitary arrangements in all directions and in all respects.

It has also been rendered evident in what has been said that infectious agents differ markedly from each other in their behavior, so that while public sanitation aims at those measures which are found to be most widely beneficial, it should not forget that each infectious disease is as much a separate problem in its prophylaxis as in its symptomatology, etiology and treatment. It will not aim to combat cholera with the means found best adapted to scarlet fever, but it will adopt preventive measures as directly to the specific end in view as possible.

In presenting to you the results of researches chiefly bacteriological concerning the scientific basis of preventive medicine, I hope to escape the accusation of onesidedness and narrowness by the statement that I do not for a moment intend to imply that the bacteriological method is our only source of accurate knowledge on the subjects which have been considered. My aim is accomplished if I have succeeded in making clear that this method has established facts which aid in a clearer conception of the causes of some important infectious diseases, in a better understanding of the sources and danger of infection, and in a more efficient selection and application of sanitary measures.

If this science of only a few years' growth has furnished already acquisitions to knowledge so important, so far reaching, may we not look forward with assurance to the solution of many dark problems in the domain of infectious diseases, problems the solution of which may yield to preventive medicine a future of usefulness and success which we cannot now foresee.

DR. PHILIP F. BRAKELY, who for forty years was the Secretary of the Medical Society of Warren County, N. J., died in Belvidere, at the age of 75, on July 3. He was a representative man in northern New Jersey, just as Dr. Wm. Elmer, who died six days before him, was an able standard bearer in the southern section of the State. Dr. Brakely was early identified with the American Medical Association, and a permanent member of the State Society. His death has been ascribed to the infirmities of advancing age, culminating in cardiac syncope.

ADDRESS ON THE PROGRESS OF MEDICAL SCIENCE DURING THE PAST HALF CENTURY.

BY SIR JAMES GRANT, M.D., K.C.M.G.,
PHYSICIAN TO THE GOVERNOR-GENERAL OF CANADA.

Delivered at the Fortieth Annual Meeting of the American Medical Association, Newport, R. I., June 27, 1889.

Sir James Grant, M.D., of Ottawa, Canada, upon being called upon, rose and spoke as follows: I beg to return to you my sincere thanks for the invitation extended by a committee of this Association to be present at this meeting of the medical profession of the United States, and it is an additional source of gratification that I am asked to a seat on this platform. I am reminded of the fact that when the Marquis of Lorne was governor of Canada, the Royal Society was invited to lunch at the government house. When the health of the president of the United States was proposed, a sentiment which we Canadians fully appreciate, and which we are delighted to honor next to that of our glorious Queen Victoria, Mark Twain was asked to respond. He thanked his excellency for the compliment and was proud to be the recipient of the distinction, but regretted that being unprepared he was unable to respond. I feel very much in the same position on being called upon to speak to this large body before me. For fully twenty-five years I have been in the habit of attending the meetings of your Association at various points, and it is to me a source of pride and gratitude to be able to note the progress of that profession to which I have the honor to belong. This is an exceedingly important epoch in the history of our profession. You have just celebrated your one hundredth anniversary, which marks the progress of this great country. In entering the hall to-day, the observation dropped from a bystander that the insane doctors were meeting here. It struck me as somewhat peculiar, inasmuch as I was not aware of the fact that this meeting could appropriate that idea. It was soon cleared up as I learned that that branch of the profession met here. Let me, for a short time, draw your attention to the remarkable advance in the several departments of the profession, which has been made within the past century.

It was in 1835 that Gardner Hill, of the Lincoln Lunatic Asylum, announced the treatment of insanity by non-restraint. Prior to that time the poor lunatic was subject to be confined in the corner of a cell with chains round his neck, his arms manacled, and pendulous clubs attached to his feet in order to prevent locomotion. His food was served to him as it would be to an ordinary quadruped, and in fact the whole treatment of the insane in those days was most irrational in its character. Much credit is due to Pinel in Paris, Tuke of York, and Charlesworth in the city of Lincoln asylum, in which the grand final experimenting of entire freedom of the insane was carried out.

We find here that in the great institutions of this country for the treatment of the insane every indication of progressive development as to the principles of treatment in cases of mental aberration have been carried into operation most successfully. You have undoubtedly great workers in the subject of psycological investigations. When in Edinburgh some years ago, Dr. Tuke, the author of that admirable work on "Insanity," remarked to me that by far the best journal on psycological medicine was that published by the late Dr. Jewell, of Chicago. The investigations of the late Dr. Gray, of Utica, are well known, doubtless, to every member of the Association. The subject of cerebral pathology attracted his closest attention, and his demonstrations by the large microscopic sections of the brain, which he was enabled to make, did much to convey an accurate idea of cerebral structure under very diverse circumstances. Strange to say that some of the most violent forms of insanity ever under the microscope have not been traced to anything like change of structure. Such, also, was the impression conveyed to me by Tuke, of Edinburgh. These, of course, may be looked upon as irregular cases, as usually insanity rarely takes place without some definable reason in the great nervous center. Under these circumstances is not the trite and laconic observation of *Punch* brought home to us with more than ordinary force: "What is matter, never mind, and what is mind, that's the matter." Pursuing this subject still further the investigations of our physiologists within the past quarter of a century have certainly accomplished much as regards our knowledge of the nervous system. Disturbed cerebral centers, frequently telegraph their abnormal condition to the peripheral surface, producing an abnormal condition of facial expression. By a process of careful analytical induction such men as Ferrier, of London, Hamilton and Seguin, of New York, and Hammond, of Washington, have been enabled to take stock of the changes and define the region of the disturbed centers. This embraces the great recent advances in the subject of cerebral localization, and is the very cue to the advances in cranial surgery undertaken by such men as Horseley, of London, McKeon, of Glasgow, and Seguin and Warren, of New York.

In looking around me on this platform, I am extremely grateful to find present one of the ex-presidents of this Association, Dr. Bowditch, of Boston, whose name is so closely associated in the subject of pleuritic effusion, and who worked so vigorously to convey his accurate impressions as regards the treatment of this important thoracic disease. Not alone have his observations

been confined to the chest, but in the domain of preventive medicine he has also been one of the pioneers. It has been well said that "an ounce of prevention is better that a pound of cure," and notwithstanding the fact that the members of the medical profession in the advocacy of sanitary science, are curtailing very effectively the means of their ordinary livelihood, and still their philanthropic efforts are never stayed where they can be of advantage to the public at large. The great public institutions of this country give evidence of the principles of sanitary science. The jails are made comfortable even for the most dejected criminal. The hospitals give evidences of thorough ventilation and ample supply of light and all the modern improvements for sewage and water supply, very important factors in the treatment of the sick. The articles of diet are being carefully investigated. Milk is now known to be a prolific source both of scarlet fever and diphtheria, and in early life being a common source of diet, how necessary are the investigations of the sanitarian. Less than half a century ago, Farr, of London, gave a great impulse to the progress of sanitary science by the introduction of tabulated statistics as to the life and death rate. In the various medical institutions in this country, as well as in Canada, the subject of sanitary science is receiving the most careful consideration, and very justly so, inasmuch as it pertains most closely to the welfare of society at large. Let me draw your attention for a few moments to a great gymnasium of the human system, of which we have evidence in the surgery of the abdominal cavity. This country has reason to feel proud of what has been accomplished in this department. The name of Ephraim McDowell, of Kentucky, with you, as with ourselves, is a household word. He possessed the skill, the forethought, and the knowledge which enabled him to undertake the first ovariotomy. Following rapidly in his path came Dunlop, of Ohio, and Kimball, of Lowell, Mass., the latter of whom maintains the vigor of youth, although considerably over his seventieth year. These men constitute an intellectual tripod, if I may so term it, in the domain of abdominal surgery. Before me I see a gentleman whose name I cannot refrain from giving expression to, Dr. Senn, of Chicago, who has accomplished so much with reference to the lesions of the intestinal canal. His name will undoubtedly become a household word amongst the members of our profession. While adverting thus personally to what your men have achieved, I feel confident you will join with me in recognizing the admirable achievements in the same line of thought brought about by such men as Sir Spencer Wells, Drs. Thornton, Bantock, Lawson Tait, and Keith, of Edinburgh. Almost every organ in this cavity has been operated on successfully, and the achievements mark beyond a doubt the progress of surgery during the latter half of this century. There is another department concerning which I desire to allude briefly, namely, that of therapeutics. We have with us to-day Shoemaker, of Philadelphia, and Prof. Stuart, of McGill University in Montreal, both of whom are actively engaged in therapeutic inquiry. Medicines are now no longer, we hope, administered empirically; the why and wherefore are being inquired into most carefully. How the remedial agents act directly or indirectly on the blood and tissues is the subject of much physiological research. Here comes in a question of the slowing of the heart's action by digitalis and the reduction febrile states of the system by antipyretics. Much credit is due to the pharmaceutical associations of this country for the elegance of the preparations placed before the profession, so much so that the old British pharmacopœia must undergo considerable modification. There is also a marked advance in dietetics embracing peptonoids and very digestive materials introduced to tone and assist digestive function. Cod liver oil and its emulsion also occupy an important place as therapeutic adjuncts. And in addition the triturates so recently introduced are doubtless valuable as means of medicinal administration.

On my way from Boston, yesterday, I was gratified to read the instructive address of the Hon. Chauncy Depew to the legal profession, in which he referred to the representation of this country. Of the thirty-two presidents, eighteen were members of the legal profession, and during the past one hundred years, in eighty-two of that period the presidential chair has been occupied by legal lights of this country. The bearing of this subject is extremely important, inasmuch as the medical profession is concerned. In the Commons of Canada there are at least fifteen or twenty medical men, and in the Senate also quite a number of members of the medical profession. In the local provincial parliaments our profession is ably represented. Thus we have been enabled to guide and direct public opinion towards the important question of medical education. I listened with pleasure to the report of your committee on this subject, recommending the introduction of a higher standard in this country, both as to preliminary education and subsequent academic study. Having been upwards of twenty-two years consecutively in the Medical Council of Ontario, I have had opportunities of observing the importance of this question. The local Parliament of Ontario passed a bill for the formation of a Council, giving it the power to appoint examiners in medicine, irrespective of the teaching bodies, and thus guard the portals of entrance into the medical profession. Prior to this time the entrance of homœopathists and eclectics into the profession was very considerable, but now that matters have been placed on a uniform basis of

examination, except in special subjects such as homœopathy and eclectic materia medica, we find that this elevated standard has improved very materially the entire status of our profession; in fact, to-day there are very few graduating homœopathists or eclectics compared to the regular profession, greatly brought about by the introduction of the elevated standard of medical education.

In the great medical centres of this country we cannot fail to miss many of the old landmarks, men like Dunglison, Gross and Pancoast, of Philadelphia; Parker, Buck, Marion Sims, Flint, Hamilton and Van Buren, of New York; White, of Buffalo; Brainard and Jewell, of Chicago. These men gave a force, a character and an impulse to the profession recognized throughout the civilized world. Younger men are following rapidly into the path of distinction, and have achieved more than an ordinary celebrity, such as Thomas and Emmett, of New York; Storer, of Boston; and Goodell, of Philadelphia; particularly in the diseases of women. I am pleased to observe here so many younger members of the profession. To attend these meetings is a duty they owe not only to themselves but to the communities in which they are laboring. Here we receive, as it were, a bird's eye view of the progress of our profession in every department, and the very intellectual friction produces a tonic influence which sends every member of this Association home with renewed vigor in that profession we delight to honor. A young Western physician, recently visiting Paris, remarked to his professor if he knew so and so in the medical profession; the reply was that he did not. "What has he written?" was the question asked. The young physician answered, "He has not written anything so far as I know, but he has a very large practice." To the younger members of the medical profession I would say, in order to achieve a lasting reputation, record your facts, note carefully bedside observations and do not be in a hurry in drawing sudden conclusions. Thus you will be enabled to contribute your mite to the journalism of this country, and support a most commendable department of literature which guards over the best interests of our profession.

To the profession in Canada permit me to say that I consider ourselves one people. Placed as we are on either side of an imaginary Chinese wall we speak the same language, we enjoy the same literature, we take our inspirations from the same fountains of science in all that pertains to the best interests of our profession, and I will say, in as far as the unity of that profession is concerned, that the beautiful sentiment expressed by Her Majesty the Queen on the completion of the Atlantic cable applies equally well to our profession: "What God hath joined together let no man put asunder." In conclusion let me again return you my warmest thanks for the kind reception I have received and the delight I have experienced in the presence of your great historian, Bancroft, and many other old friends I see around me still in the vigor of life. Let us then work on to do honor to our profession, to alleviate the sufferings of humanity, and in that profession to perform the important responsibilities assigned to our respective charges. And I feel I cannot do better than express the lines so beautifully written by your gifted poet who now slumbers amidst the illustrious dead of this great Republic:

"Let us then be up and doing,
With a heart for any fate;
Still achieving, still pursuing,
Learn to labor and to wait."

The distinguished speaker was frequently interrupted by loud applause.

ORIGINAL ARTICLES.

CHRONIC INVERSION OF THE UTERUS. REDUCTION BY A NEW METHOD.

Read in the Section of Obstetrics and Gynecology, at the Fortieth Annual Meeting of the American Medical Association, June 25, 1889.

BY HENRY O. MARCY, M.D.,
OF BOSTON.

It is my purpose in this paper to consider only chronic cases of inversion of the uterus, as they are usually presented to the attention of the gynecologist. Cases of partial inversion occurring at labor are believed to be far more common than the teachings of the text-books would lead us to accept. More than once it has occurred under my own observation, and in a recent discussion upon the subject by the members of the Boston Gynecological Society, a considerable number of cases were reported.

It was undoubtedly more frequent during the earlier practice of the midwives, when traction upon the umbilical cord was commonly practiced, in order to bring away the placenta. There is much disagreement of opinion as to the cause of inversion even in these cases, although it is conceded that the uterus is generally very flaccid and muscular contraction of the organ is either irregular or wanting. When the inversion is complete, under such circumstances, the hæmorrhage and shock are often so great as to endanger life.

When promptly recognized the reposition of the organ is generally not attended with serious difficulty. If the placenta has not been detached for the obvious reason of lessening hæmorrhage, it is better to replace, if possible, before separation. This, however, is exceptional, since a more or less partial separation takes place, accompanied by great hæmorrhage. If the cervix is firmly contracted reposition is no longer easy, but nothing is gained by delay and reduction must be accomplished regardless of difficulty. When reposition has taken place, the uterus must be supported

until it is firmly contracted. It has generally been considered wise to tampon the vagina and to retain the patient in the horizontal position, upon the back, for a considerable period, in order to prevent contraction of the abdominal muscles, but it is extremely probable that such precaution is unnecessary and ill-advised.

Intra-uterine growths, usually submucous myoma, very rarely produce inversion of the uterus. When it thus occurs the uterine contraction upon the growth causes a deflection of the fundus or place of attachment, which goes on slowly by traction from above downwards to bring about this result. The late Professor E. Martin, of Berlin, reported a case, in 1869, where a myoma the size of a fist was removed from the fundus of a completely inverted uterus in a multipara, aged 46, which had produced profuse hæmorrhage. Spontaneous reduction of the organ took place a few days later.

Langenbeck and McClintock each report a similar case. Dr. Emmett, in 1869, removed a myoma from the fundus with the écraseur and reduced the inversion by taxis. It is variously estimated that from 5 to 8 per cent. of the cases of inversion are due to this cause.

Several writers of prominence have maintained that irregular uterine action is occasionally the cause of inversion, and that it usually commences about one horn of the uterus. This was especially maintained by Kiwisch. Based upon this view, Dr. E. Noeggerath, of New York, has devised his method of reduction, which consists in compressing the uterine body opposite to each horn, so as to indent one of these and thus offer to the cervical canal a wedge which passes up and is followed rapidly by the other and the whole body of the uterus. Dr. Thomas endorses this method as of great value, and states that he has twice reduced an inverted uterus successfully in this way. Dr. Thomas reports a case operated upon by Dr. Budd, of New York, for the removal of a supposed fibrous polyp, the size of a hen's egg, attached to the uterine cavity near the entrance of the right Fallopian tube. Careful examination, however, showed that it consisted of one horn of the uterus, with a part of the corresponding Fallopian tube and round ligament, thus demonstrating the case to have been one of partial inversion. Reports of cases of inversion of the uterus, associated with a variety of growths, usually ascribed as cause, are to be found scattered through the literature of medicine. Pathological preparations showing this interesting condition are also preserved in a considerable number of collections.

Improbable as it may seem, it still must be accepted as demonstrated that cases of so-called spontaneous inversion have occurred. Several such cases are recorded by Dr. Thomas and others. These, however, as well as cases of spontaneous reduction, must be considered as accidental curiosities. It is very probable that the more careful study of cases of this character would make clear a series of causes altogether overlooked. In the Second Volume of the "American System of Gynecology," recently published, is found an excellent article upon chronic inversion of the uterus, by our distinguished countryman, Dr. S. C. Busey, of Washington. He concludes that about 87.5 per centum of all the cases belong to the puerperal variety. "Of 224 cases collected by Crampton, 196 are noted as having occurred simultaneously with the termination of labor. Of the remaining 25 cases, in 12 the accident occurred during the first hour after labor; in 7 during the first day; in 2 during the first week; in 2 during the first month; in 1 during the fifth month; and in 1 during the thirteenth month. The direct causal relation of parturition and the puerperal period to the displacement is thus very clearly demonstrated."

Inversion of the uterus is fortunately a very rare accident. "Madden estimates it to occur only once in 190,000 labors. Reeve at one in 140,000 cases, Aveling at one in 100,000. In the Vienna Lying-in Hospital, from 1845 to 1882, in a total of 280,000 labors, but one case occurred."

Crosse's[1] monograph upon inversion of the uterus is still to be considered as one of the most valuable contributions upon the subject. He collected the history of about 400 cases. He states that about one-third of all the cases, under whatever circumstances, or in whatever degree they occur, prove fatal either very soon or within one month. He analyzed 109 fatal cases. Seventy-two proved fatal within a few hours, most of them within half an hour; 8 cases proved fatal in from one to seven days; and 6 in from one to four weeks. If the patient survive a month the case is chronic and the immediate danger is small. But the danger recommences at eight or nine months, when the menstrual function is resumed. Many of these will die within two years. Cases as usually presented to the gynecologist, by a careful examination, should be easily diagnosticated. Yet in the earlier history of uterine surgery the organ was occasionally removed, under the belief that the operator was dealing with a uterine polyp.

The treatment of chronic inversion of the uterus furnishes a chapter of exceptional interest to the surgeon. Until within the present generation the reposition of the organ was supposed scarcely possible, and if life was seriously threatened amputation was advised. It was not until about 1858 that the attention of the profession was seriously called to the systematic attempt at reduction of the uterus in chronic inversion. The few cases that had been successfully treated prior to this date had been reduced by manipulative dexterity and regarded as accidental rather than systematic.

[1] An essay upon "Invertio Uteri," by John Green Crosse, London, 1845.

In 1858 the late Professor James P. White, of Buffalo, published his method of reduction by continued elastic pressure. His first case occurred in 1856. His second in 1858. Dr. Tyler Smith, of London, published his method also in 1858, which is a combination of elastic pressure and taxis. Dr. White's procedures are so well known that detailed description is unnecessary. A soft-rubber, cup-shaped end of the instrument receives the fundus. A wire spring capable of sustaining ten pounds pressure is adjusted to the other end, and so arranged that it may be brought to bear against the breast of the operator. Bimanual manipulation is an important part of Dr. White's method. One hand grasps firmly the uterus thus supported, while the counter pressure is maintained upon the cervix through the abdominal wall by the other. In Dr. White's first case the inversion was of eight days' standing; in his second, of nearly six months' duration. In this last the organ was reduced after about one hour's continuous effort. In Dr. White's article upon "Chronic Inversion of the Uterus," published in the "Transactions of the International Medical Congress," Philadelphia, 1876, he concludes, based upon the experience of ten cases, "the result has been, in all the cases encountered, restoration by manipulation on the first trial, and, as is believed, without serious injury to the tissues, thus confirming the conviction that all cases are curable, irrespective of their duration."

Dr. Clifton E. Wing, of Boston, reported a case, in 1879, where he reduced an inverted uterus of about three months' duration by continuous elastic pressure. Elastic tubing was attached to the distal end or stem of a cup-shaped instrument adjusted to the fundus. These ends were drawn tight and attached in front and behind to a waist belt. The amount and direction of the force was found to be easily within control. "The evening of the second day there was evidently some gain. The evening of the third day the patient felt a little restless. . . . . She slept well under a dose of morphine, but was waked in the middle of the night by feeling something 'jump inside.' On examination in the morning I found the uterus replaced and the end of the instrument extending up into its cavity." Rapid convalescence followed.

Aveling has modified the methods of Drs. White, Tyler Smith, and Wing, by giving the stem supporting the cup a sigmoid curve, so as to carry the direction of the pressure in the line of the upper axis of the pelvis. A belt is applied around the waist and fastened to braces over the shoulders. By this method elastic tension is secured. The patient must be confined to the bed, morphia given to control pain, and the bladder evacuated by the catheter. In eleven successful cases Aveling reports the average time for reduction at about forty hours, the longest being fifty-four and a half hours, the shortest nine hours.

Dr. Robert Barnes, of London, in his work upon "Diseases of Women," figures an instrument which he calls his elastic pessary. This he described and first published in the *Obstetrical Journal*, in 1873. He states "that he attempted to reinvert the uterus in 1868, by continuous elastic pressure, maintained for five days, but was unsuccessful."

The elastic pressure applied by the late Dr. Tyler Smith consisted of an air pessary, retained in the vagina by a T bandage. Barnes, Wing, and Aveling, only modified the method of Dr. White by making the pressure in a graduated elastic force minimized in amount, but which was necessarily in the same ratio greatly extended in time. No new principle was involved and the modifications of application, may, at the best, be considered of doubtful value. Manual manipulative measures, modified but systematized taxis, have also their modern exponents.

Dr. Emmett's method consists of "encircling with the fingers and thumb that portion of the body close to the seat of the inversion, which is firmly grasped, pushed upward, and the fingers then immediately separated to their utmost, at the same time the other hand is employed over the abdomen, in the attempt to roll out the parts forming the ring, by sliding the abdominal parietes over the edge." Thus the effort is systematically made to return first the tissues last displaced, rather than to bring to bear the force upon the fundus proper. This is, physiologically, eminently correct and scientific.

Courty[2] carried the index and middle fingers of the left hand up the rectum and with them fixed the cervix, and then continued the taxis, as advised by Emmett.

Tate[3] carried this method further, by the introduction of one forefinger into the bladder, the better to hold the cervix for the purpose of counter pressure. The uterus held in fixation from above downwards by fingers in the rectum and bladder, the pressure is applied by the thumbs upon the fundus.

Surgical intervention has not been wanting as an aid for the reposition of the inversion of the uterus. Such measures would naturally be applied to the constriction at the neck, the seeming objective factor to be overcome.

Dr. Barnes[4] writes, "For twenty years I have taught in my lectures that the unyielding cervix may be divided by incisions carried into its substance from above downwards at different points of its circumference. Pressure then applied will cause it to yield more easily. Hugnier, Professor Simpson, and Dr. Marion Sims have suggested this plan." It was, however, not until 1868 that Dr. Barnes had the opportunity to carry his teach-

[2] Maladies de l'utérus. 1866.
[3] Cincinnati Lancet and Observer, March, 1878.
[4] Op. cit, page 635.

ings into effect. After continuing elastic pressure by the method of Tyler and Smith for five days without success, Dr. Barnes secured the fundus by a noose of tape and drew the organ as far externally as seemed safe, and then incised the neck one-third of an inch deep, laterally and posteriorly. The cervix yielded and the restoration was complete, although lacerations extended quite a little from the incisions. A good recovery followed. Dr. Barnes recommended only lateral incisions of moderate depth, as an aid to sustained elastic pressure. He has since used this method with equal success. Dr. Thomas, of New York, attempted it, but the bleeding proved so very serious, from the division of the circular artery, that life was endangered. Hæmorrhage was controlled with much difficulty. About one week later he reduced the inversion by a method which he had had under consideration for a considerable period by opening the thin abdominal wall over the cervix and dilating it by a glove-stretcher instrument. This, however, was accomplished with much difficulty, owing to the elastic contraction of the cervix. It has been resorted to several times by Dr. Thomas and others, and is commended by this author as affording another means of dealing with this most distressing accident, which may be accepted in preference to amputation. In case of failure amputation may at once be advantageously performed.

The early statistics of amputation give as a result a mortality rate of 25 to 30 per cent. Although the operation for amputation is doubtless ever to be regarded as a major one, involving serious risks to life, there can be no doubt that the death-rate as shown by collated statistics is very much greater than would occur under modern surgical procedure. The comparative absence of danger now attending aseptic laparotomy would cause the profession to look upon Dr. Thomas' operation far more favorably than when first published, seeming, as it then did, a bold, ingenious, but dangerous innovation. It is, however, to be considered if access to the uterus from above gives, after all, the advantages which *a priori* had been expected. The elastic contraction of the cervical fibres is overcome only with the greatest difficulty. In illustration of this I quote from a paper by Dr. Paul F. Mundé, entitled "Laparotomy for Reduction of an Inverted Uterus," read before the Obstetrical Society of New York last October, and published in the *American Journal of Obstetrics* for December, 1888.

"Rapidly making a 2-inch incision through the abdominal wall, I pushed the uterus from the vagina upwards, so as to almost bring the ring into the wound, and, first with my fingers, then with a Palmer's steel dilator tried to stretch it apart. Failing in this, I sent for a glove stretcher, which was disinfected and inserted through the cervical ring to the very bottom of the inverted uterus and separated to the utmost. The ring was thus completely dilated and I expected immediate reduction, but as the glove stretchers were slowly withdrawn to allow the *pari passu* reposition, from the vagina, at the instant the stretcher slipped out of the ring, the latter closed like a vise; and although the attempt was repeated again and again, no rapidity or concurrence of action in pressing the fundus upward, succeeded in anticipating the contraction of the ring. It seemed almost incredible that it should have been impossible to so dilate and keep open the ring, when it was not only easily accessible, but even visible at the abdominal incision, so as to enable me to slip the fundus back through it. But such was nevertheless the case, and my spectators will, I think, give me credit for having tried faithfully to save this woman's uterus. As a last resort I followed a suggestion of Dr. Lillienthal, my house-surgeon, who assisted me, and passed a Peaslee's needle from the vagina through the firmest portion of the fundus uteri and out of the ring and the abdominal wound, attached a long loop of the thickest silk to it, drew the loop out of the vagina and tied a piece of large, double-rubber drainage-tube to it, as a fulcrum upon which to exert traction. I chose a flexible tube in preference to a flat button of horn or metal, which were at hand, because I feared the latter might prove an obstacle at the contracted ring. Then dilating the ring with the glove stretcher, I tried to draw the fundus up through it by making steady traction on the loop of silk. But the pulpy uterine tissue gave away and the drainage-tube suddenly appeared in the abdominal wound." Dr. Mundé recognizing that no further effort for saving the uterus was justifiable drew the organ as far as possible from the vagina and ligated high up with an elastic cord. From the abdominal cavity he removed the ovaries and tubes and closed the wound. On the thirteenth day the elastic ligature was found loose in the vagina, and after this the patient made an uninterrupted recovery.

Were it possible to find easy and safe access to the cervical canal through an opening in the abdominal wall, Dr. Mundé's case emphasizes the difficulties of overcoming the elastic contraction of the cervical fibres experienced by Dr. Thomas in his first case, and which has been met also by other operators. Again, we have to consider the importance of the danger, and which, so far as I know, has not been referred to by any operator, of pressure upon the inverted Fallopian tubes, carried as they are of necessity quite within the inverted uterus. The method of Dr. Lillienthal is certainly ingenious, is philosophic, and was deserving of a better result. There can be little doubt that the tissues of the fundus were materially impaired in their integrity by the previous prolonged manipulative procedures.

In 1877 I devised a method for the reduction of

the inverted uterus by elastic pressure, the same force to be applied simultaneously upon both the fundus and cervix. This was to be effected by first tying into the cervical tissue four metallic rings. A strip of pure rubber about 1¼ inches in width and 18 inches long was slit at either end and nearly to the middle. The ends were to be threaded through the rings and continuous traction applied. I was met with the objection that the theory was perfect, but that the rings could not be made to hold in the tissue. In order to demonstrate the fact, as well as to serve another purpose, which seemed to me might possess material advantage, I applied rings as above suggested to a cervix uteri which I desired to dilate and thus carried by elastic force a conical plug into the cervical canal. When the sutures were deeply applied the cervical tissue was found to bear any reasonable amount of tension protracted through several hours. After a long series of experimentation for the purpose of dilation of the cervix these comparatively crude and clumsy efforts led up to the construction of the repositor, which in its present form seems to answer every requirement. After waiting twelve years the following case gave the opportunity of testing its value.

Mrs. B., æt. 33. Healthy girl. Menstruated at 14. Married at 30. Well and regular in menses until marriage, three years since. Eighteen months ago aborted at the third month. June 19, 1888, was delivered at term with instruments, under ether, by Dr. James McDonald, of Boston, after twenty-four hours of severe labor. Made an imperfect recovery, flowing more or less constantly until operation for the reduction of the inverted uterus, September 8th. Was in bed three weeks and had been confined to room since birth of child. Condition first determined by Dr. McDonald in August. He feels quite sure the inversion did not take place at time of labor. I first saw Mrs. B. the day of the operation. Patient markedly anæmic. Dr. M., assisted by Dr. Lynch, had made a prolonged attempt, under ether, that morning at reduction by taxis, without avail. Endometrius everywhere a bleeding surface. The cervix constricted to render the organ distinctly polypoid in shape. Could feel the edge of the cervical ring. I introduced, with a large, full-curved Hagerdon needle, long ligatures of No. 8 braided silk deeply through the cervical tissues on each of the four sides, equidistant, and brought them into fixation with the repositor, A steady, uniform pressure was kept, at about 8 pounds by the scale. After ten minutes the cervix had yielded perceptibly and in fifteen the organ was half inverted, the cup being covered by the retracted cervix. The operation was completely finished and instrument removed in twenty-six minutes from commencement of pressure. No shock followed and recovery was rapid. After five weeks the patient flowed to soil two or three napkins. The fourth regular menses occurred Dec. 20th. Dec. 28th visited office; not seen before since operation. Was in perfect health. Uterus not tender, not enlarged, movable and normal to feel. The pressure is applied by means of a spring concealed in the handle. The scale is graduated up to 15 pounds in order to determine the amount of force used.

In reviewing the various methods devised for the reduction of the inverted uterus it will be observed that the place of counter pressure is of necessity found in the vaginal attachment of the organ. In order to bring the force to bear upon the cervix the method of bimanual manipulation, as devised by White, Sims, and others, was appreciated as of great importance. First, by the hand extended over the abdomen, then by two fingers introduced into the rectum, this being further supplemented by the finger introduced into the bladder.

In the method for the application of continued elastic force, first advocated by Drs. Tyler Smith and Barnes, and perfected by Dr. Aveling, the fixation of the cervix is necessarily abandoned and the counter pressure is brought to bear directly upon the vagina and surrounding organs. The force thus applied, at the best, acts only indirectly on the cervical ring, which is the chief criticism of the method. Theoretically a force should be applied to draw down upon and invert the constricted cervical fibres at the same time that pressure is made upon the organ from below upwards. This should be elastic and continuous, but not too great. This force Dr. Emmett wisely recognized in its application by his method of taxis. As illustrated in the case of Dr. Mundé, the dilatation of the cervix, at the most, is only one factor of the problem. Let that force be converted into one acting at the same time from below upwards upon the fundus and the elastic constriction becomes transformed into a power to serve for the reduction of the organ. When applied in this manner the cervical fibres, little by little as they dilate, receive within their grasp and retain the returning portion of the organ. My method is simple and effective. The criticism of a number of the profession is, "I wonder that it has not been thought of before." I exhibited my repositor to Dr. Priestly, of London, when my guest in Boston, a little before the discussion of Dr. Mundé's paper, and he was kind enough to speak favorably of my method at the discussion above referred to. At the same meeting Dr. B. McE. Emmett exhibited an instrument which he had recently devised. It consists of a ring on three stems which is to encircle the cervix. The reinversion is to be accomplished by passing stitches throngh the border of the cervix and making traction outward over the rings, at the same time pressure is made from below upwards. Dr. Emmett recognizes, as I claim, that counter

pressure to be of value must act upon the cervix itself.

By whatsoever manner applied, it is certainly rational to expect that the reduction of the inverted uterus would be best accomplished by forces acting at the same time in opposite directions. As another means of securing this, Dr. John Byrne, of Brooklyn, has invented a repositor which consists of a cup for the reception of the uterus, at the bottom of which is placed a movable disc attached to a stem which can be projected upwards by means of a screw. In conjunction with it he uses a bell-shaped instrument placed over the abdomen, in order to fix the cervix, through the center of which a plug is projected by a screw attachment, for the purpose of dilating the cervix. In one or two instances this instrument has been used with a satisfactory result. Even so ingenious an instrument, although believed by Skeene to be the best devised is radically faulty. The abdominal wall and bladder, possibly other organs, must be involved between the opposing forces, and fixation of the cervix can never be absolute while there is no means of determining the amount of force applied. If, however, a uniform elastic pressure can be brought to bear at the same time, in the opposite direction, upon both fundus and cervix, it is a manifest gain. If this power is so applied that it is at once, one and the same force, it is possessed of still greater advantage. To place it entirely within the control of the operator without possibility of affecting any other organ, and reducing the power to one of actual observation, as given in pounds, is a still further manifest advantage. All these are rendered as constant and well-known factors in the application of the repositor which I offer the profession for trial and, if found worthy, adoption.

MEDICAL PROGRESS.

CONCERNING GLYCOGEN IN THE MUSCLES.—E. KÜLZ found that the quantity of glycogen contained in the muscles of the frog is increased under the influence of daily subcutaneous injections of grape sugar, even after extirpation of the liver. It seems, therefore, that the muscles are capable of making glycogen without any assistance on the part of the liver. This conclusion has recently been attacked by Laves. He extirpates the liver of geese and chickens after giving them a meal of barley and oats; ascertaining the amount of glycogen in a fragment of the pectoral muscle immediately before the operation, he repeats the determination some hours (one to thirteen hours) after the extirpation of the liver, and continually finds less glycogen at the second test. He concludes therefrom that the pectoral muscle is incapable of producing glycogen, in the absence of the liver, at the expense of the feculents in the nourishment.

Schmelz (*Zeitschrift für Biologie*, XXV, p. 180, 1888) repeated Laves' experiments on chickens whose livers had not been extirpated, in this way that he ascertained the amount of glycogen in the muscles before and after a meal rich in hydrocarbonates (barley cane sugar), and he discovered that even twenty-four to thirty-six hours after the meal the muscles did not show yet an increase in glycogen, although the liver was intact. It is, therefore, hardly surprising that Laves discovered no increase of glycogen after the liver had been extirpated, and the experiments of Laves can only serve to settle the question raised by E. Külz, Schmelz completes his work by drawing a parallel between the results of determinations of glycogen by weight and by circumpolarization. He recommends the determination by polarimeter (originated by E. Külz), as expeditious and sufficiently exact.

Luchsinger stated that glycogen disappeared much more rapidly from the muscles than from the livers of animals which had been given no food for a long time, and that this substance did not exist any more in the muscles after a few days' fasting. He drew the conclusion from it that glycogen should not be considered as an indispensable constituent of muscle-fibre and as the source of muscular energy.

Aldehoff (*Zeitschrift für Biologie*, XXV, p. 137, 1888) has taken up this question under the direction of R. Külz, using for the determination the method of R. Külz and A. Cramer. He finds that under the influence of fasting, in the chicken, the pigeon, the rabbit, the horse and the cat, the glycogen diminishes less rapidly in the muscles than in the liver, and that even after a protracted fast the muscles are still relatively rich in glycogen. The muscles of two horses which had received no food for nine days furnished the highest figures of glycogen (2.43, 1.34, 1.28 and 0.98 per cent.) which have ever been found in muscular tissue. The hearts of these two animals contained 0.82 and 0.58 per cent. of glycogen.

The results of determinations of glycogen made by Manché (*Zeitschrift für Biologie*, XXV, p. 163, 1888), by means of Külz' method, confirm in general the statements of Weiss and Chandelon: diminution of glycogen in the muscles through tetanization of the muscles or through ligature of the nutrient arteries; increase of glycogen through cutting of the motor nerves.—*Revue des Sciences Médicales*, No. 66, 1889.

ON THE TREATMENT OF TABES BY SUSPENSION.—DUJARDIN-BEAUMETZ tried this treatment on twenty patients, with the following results: In most cases at first an improvement is noted. The patient feels stronger and finds incoördination di-

minishing; the lumbar pains are also less intense. But this improvement does not continue and ceases after two or three weeks. In some cases failure is total, and not the slightest improvement is obtained. The author is as yet unable to say why in some cases this method is effective and in others it is a failure.

So far no experimental evidence of the improvement obtained had been given; it has been furnished by us by using Marey's method. It consists in the reproduction by photography of the attitude of a patient in walking. For this a photographic apparatus is necessary, provided with an interrupter which makes it possible to take pictures in a small fraction of a second. A healthy individual is dressed in black and made to walk before a dark background, electric lamps are fastened to the head, the shoulder, the hip, the knee, and the ankle. A series of illuminated points is thus obtained which connected constitute a schema of the normal walk. The same procedure gone through with an ataxic patient furnishes the picture of the walk peculiar to individuals afflicted with tabes. The pictures taken after the suspension has been performed several times, show that the walk of the patient approaches very near to the normal. This is an absolute scientific proof of the beneficial influence of suspension. As to the mode of procedure the following should be remembered: It is important that the chin and nape of the neck are properly supported, and also that the patient is supported at the armpits. At first the patient should be left suspended for a very short time only, about fifteen to thirty seconds; gradually this is increased until we arrive at the maximum of three minutes. It has been claimed that there is no danger in prolonging considerably the time of suspension, but Dujardin-Beaumetz thinks this is wrong and might result in grave accidents.

Regarding the question, how suspension acts in an ataxic patient, and how it is that this method not only brings about a diminution of the incoordination, but also relieves the lightning-pains of patients with tabies, he says: "Against these lightning-pains the elongation of the nerves has been practiced, first by Langenbach, in 1879, afterwards by Debove and Gillette, in France during 1880. Elongation of nerves or nephrostheny was first used in therapeutics by Nussbaum, in 1872, later on by Billroth. In 1876 Verneuil applied it to the treatment of tetanus. According to him elongation acts like an incomplete section of the nerves. Vogt maintains that elongation produces its favorable results by acting upon the neurolema, the pulling causing a rupture of the vessels of the neurolema and the displacement of the nerve-fibrils in the same. I believe that suspension acts in the same way. It is probable that the sensitive cells of the marrow are changed in their molecular state."

However this may be, it is possible in certain cases to obtain some benefits from suspension in patients with tabes, and it would be wrong not to try this method for the cure of an affection as painful as locomotor ataxy.—*Journal de Médicine de Paris*, May 5, 1889.

ON REDUCTION OF NITRATES THROUGH CHOLERA BACTERIA.—DR. PETRI has made a series of experiments which yielded the following results:

1. Cholera bacteria reduce in their growth nitrates to nitrites.

2. The usual culture media, especially gelatine, and often also common cooking salt contain not inconsiderable traces of nitrate.

3. The red cholera reaction is accomplished through the medium of these impurities, *i. e.*, through the reduction of the nitrates.

4. An oxidation of decomposed ammonia through the vital action of the cholera bacteria is not yet proven and is improbable, in view of the fact first mentioned.—*Centralblatt für Bakteriologie und Parasitenkunde*, No. 18, 1889.

EXPERIMENTS REGARDING THE PRODUCTION OF THE VESICULAR MURMUR.—DEHIO (of Dorpat) says: Contrary to the theory according to which the vesicular murmur results solely from the propagation of the tracheo-glottic murmur to the parenchyma of the lung, the vesicular murmur can be plainly distinguished on auscultation, despite the intensity of the wheezing, in cases of stenosis of the larynx. Besides, on auscultating the lungs after Dehio had substituted a simple rubber tube for the trachea and larynx, he could distinctly hear a vesicular murmur which could only be attributed to a transmission of the concussion in the interior of the alveoli of the residual air by the column of inhaled air.—*La Semaine Médicale*, No. 17, 1889.

THERAPY OF DIPHTHERIA.—DR. BURGHARDT has been making for seven years experiments in the cure of diphtheria by blowing a mixture of sulphur and quinine in equal proportions into the larynx, on the tonsils, into the nasal cavity and into the pharynx. These applications were made twice every day, and nothing must be taken for two hours afterwards; spitting must also be avoided. The powder is odorless and does not produce any disagreeable symptoms. Immediately after the application the patient is quieter, fresher, the fever ceases, the feeling of weakness leaves him. The applications are continued after all symptoms have disappeared. Burghardt has not met with a single failure. Of 33 cases, some of which were very dangerous, not one terminated fatally. Time of cure two weeks.—*Wiener Medicinische Wochenschrift*, No. 17, 1889.

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SATURDAY, JULY 20, 1889.

PREVENTIVE INOCULATION.

A lecture that should receive a great deal of attention from the world of medicine is the Croonian lecture on "Preventive Inoculation," recently delivered by M. ROUX, in behalf of M. Pasteur. It is almost eight years since the great scientist laid before the members of the International Medical Congress assembled in London an account of the researches, carried on in his laboratory, on preventive inoculations for chicken cholera and splenic fever. Has the work then begun fulfilled its promise? What place have the principles that it involved in the science of to-day?

In speaking of preventive inoculation we need not stop to consider the great discovery of Jenner. He showed that it is possible to protect ourselves from a dreaded disease by inoculation with a trivial one; but he gave no general method leading to the prevention of other infectious diseases. The discovery of the power of artificially attenuating—or weakening—a virus does furnish us with a veritable method of preventive inoculation; and it has, says M. Roux, given us an uninterrupted series of good results. In revealing the the nature of ferments Pasteur taught us the nature of the poison of infectious diseases. We know—or think we know—that viruses are living beings, microbes, and that the development of microbes in the living body produces the phenomena of infectious disease. The processes by which we are enabled to obtain the culture of microbic ferments in a state of purity is the same that has enabled us to obtain pure cultures of microbic virus outside of the body. The indispensable condition of success in these cultivations is absolute purity. Having obtained them in a state of purity can we not modify them by cultivation in the same way that other plants are modified? We know that many plants that are poisonous in a wild state are harmless or edible in the cultivated state. To modify the viruses by special modes of cultivation was the task to which Pasteur set himself.

Pasteur's first attenuated virus was obtained while studying chicken cholera. His experiments showed that the viruses of infectious diseases are no more the unchangeable entities they were supposed to be, but that, like all other living beings, the microbic virus is susceptible of modifications that heredity perpetuates; that above all, it is the virulent character that is modified, and that this modification can be produced artificially, and regulated according to the wishes of the experimenter. He established the attenuating influence of the air, and explained how the activity of a virus, under natural conditions as seen in an epidemic, is preserved or exhausted, and how the same infectious malady may be sometimes malignant and again light. All that was claimed by Pasteur in regard to chicken cholera was confirmed by him in his inoculations for anthrax—as is now admitted by Koch and others that contested Pasteur's claims. And taking into consideration the fact that we can increase as well as decrease the virulence of a virus, is it rash to believe that in the course of ages new forms of virulence have been evolved, and that the experiments on the variation of virulence have thrown a flood, and will throw a greater flood of light on that obscure question, the origin of new virulent diseases? We see how one and the same kind of microbe can produce diverse morbid effects; how, when it is active or virulent, it causes a general disease, rapidly ending in death, and in its passive or attenuated condition it produces only a special local lesion.

Almost all physicians are now familiar with Pasteur's investigations in regard to *rouget* or swine fever. The extraordinary fact was brought out by Pasteur and Thuillier in these inoculations that as the strength of the virus increases for the rabbit it is diminished for the pig; so much so

that, after a sufficient number of passages of the virus have been made through the rabbit, it has become vaccine for swine, and able to exempt them from the fatal forms of the malady. The question now arises, what would happen with certain human diseases if they were made to pass through a number of different kinds of animals? This process we can see to a certain extent in nature, and gives fresh support to the idea that the vaccine of small-pox is modified by its passage through the horse and cow. We are all familiar with the great controversy in regard to Pasteur's preventive inoculation for rabies—and we know the verdict of the English Commission, which should silence all objectors when taken in connection with the facts. The remarkable point in the discovery of the preventive inoculation against rabies is that the virus itself has not been discovered. As yet it is known to be a microbe by analogy only, since no one has been able to isolate it. Thus, since it cannot be cultivated in flasks and tubes, Pasteur has been obliged to cultivate it in rabbits, and he has been able to do this so easily and with such regularity that the cultivations are ready for use at a specified time. This is one of the strongest examples of the power of the experimental method as applied in medicine—the prevention of a malady the absolute virus of which is still unknown.

The greatest source of danger from microbes is in the poisonous products they form—their ptomaines, a striking example of which is seen in the case of diphtheria. The diphtheritic bacillus does not grow in the interior of tissues, but only on the surface of mucous membranes. The organism is poisoned by the ptomaines formed by the bacillus. These products are found with great difficulty in the body of an animal dead of an infectious disease, since the complex surroundings of the tissues is unsuitable for such research, and the microbes of decomposition themselves form ptomaines. But in cultivations in flasks and tubes we can find these products of the pathogenic activity of the microbes. The first experiments of this kind were made by Pasteur with the microbes of chicken cholera. The chemical products obtained by cultivation of these microbes are capable of causing the symptoms of the disease. In infectious diseases, therefore, the cause of death is poisoning, and the microbes are not only the means of spreading the disease, but also the makers of the poison.

These facts have a distinct bearing upon the question of preventive inoculation. When these chemical products of pathogenic microbes are introduced little by little into the bodies of animals, in such manner as to avoid causing speedy poisoning, but so as to accustom the animal gradually to their presence, the animal becomes refractory to toxic doses, and to the microbe itself. Thus, while formerly immunity could be secured only by the introduction of the microbe itself into the organism, it can now be secured by introducing the chemical substance into the tissues; these vaccine substances being the same that are known to be the cause of death in infectious diseases. And while we can reason only from what we know, we can say that, since these experiments on vaccination by means of soluble substances without microbes have been successful in various maladies, it is but natural to infer that their field of usefulness will be largely widened in the near future. It may be possible, indeed, as Roux points out, to protect ourselves from one malady by means of another; it is necessary only that the microbes of the two diseases should produce similar chemical substances.

What explanation can we give of the immunity conferred by preventive inoculation? At present we can best explain it by saying that when small quantities of the attenuated virus are introduced into the tissues the leucocytes—or phagocytes—accustom themselves to its presence, and when the active virus or microbes are afterwards injected the phagocytes attack and destroy them. But the phagocytes of the non-refractory animals cannot swallow and digest the active microbes, and cannot prevent their development. Immunity is the result of the habituation of the cells to the poisonous products of the microbes.

INTERNATIONAL COURTESIES.

The medical profession of Canada was ably represented at the annual meeting of the Association at Newport.

The eloquent address of Sir James Grant was greeted with rounds of applause, and its noble sentiments met with generous response. In this issue of THE JOURNAL a brief abstract of the address will be found.

Another worthy representative of the profession was Professor James Stewart, Registrar of Mc-

Gill University, one of the editors of the *Montreal Medical Journal*. The able articles which have eminated from his pen have been widely quoted. A hearty welcome was accorded to the entire delegation. It is to be hoped that at the next annual meeting, when it shall convene at Nashville, the American Medical Association will be honored with a like representation, from Canada.

THE RUSH MONUMENT FUND.

Had Professor William Pepper, in his eloquent address been able to speak to the entire membership of the Association, and had they listened to the stirring appeal of the Secretary, Dr. A. L. Gihon, doubtless the entire amount of money needed for the erection of the Rush Monument would have been contributed upon the spot. From the generous responses there made, it is confidently believed that a later concerted movement will accomplish this result. As a reason for their not appearing in their regular order, in the published proceedings of the Association, it should be stated that it was deemed advisable to hold the address of Dr. Pepper and the report of Dr. Gihon for use in that connection.

THE ENTERTAINMENTS.

The provisions made by the Committee of Arrangements, by the citizens of Newport, and by the medical profession of the State of Rhode Island, were in every respect all that could be desired, and nothing but an enthusiastic interest in the real work of the Association could have prevented its members from giving themselves over to a continued round of most attractive entertainments at the City of Newport. Let not the loyalty of the Association to its work in hand lead the good people of that city and State to infer that their generous hospitalities were not, to the fullest extent appreciated.

A day never to be forgotten was that when—after the Association-work was over—the Rhode Island Medical Society treated their guests to an old-fashioned "clam-bake" on the shores of Narraganset Bay.

THE JEWELL LIBRARY.

The "Jewell Library" has lately been secured as the nucleus of a great medical library for Chicago. It contains about three thousand volumes which embrace the most valuable medical literature published up to the time of Dr. Jewell's death. The necessary subscriptions were secured from a few medical men in an incredibly short time. Thus a valuable collection of medical works has been saved from being scattered under the auctioneer's hammer and the library of one of the most devoted doctors Chicago has ever known is again made available to every reader. It is expected that the Chicago Public Library will take care of these books and the additions which will be made to bring them down to the present time, until a suitable building is provided for their reception. Such building, to render the library accessible, must be centrally located. This will add greatly to the primary outlay. It is to be hoped that some Dr. Pearson will liberally endow this library of medicine.

EDITORIAL NOTES.

HOME.

DR. JOHN S. BILLINGS, of the Surgeon-General's office, Washington, D. C., has had conferred upon him by the University of Oxford, the honorary degree of D.C.L.

DR. DANIEL H. WILLIAMS, of Chicago, has recently been appointed by the Governor, a member of the State Board of Health of Illinois.

DIPHTHERIA has been prevalent at Astoria and Stineway, both places being within the jurisdiction of Long Island City; and that city, owing to a deadlock among its officials, is in a bad sanitary condition.

NEW MEDICAL SOCIETIES IN MISSOURI.—We are pleased to learn from the *Kansas City Medical Record*, that the growth of county, district and Section Societies in Missouri is very satisfactory, new ones being reported nearly every week. This is, as it should be, and we hope we may be enabled to chronicle in the near future the same activity among the profession in other States.

THE PSYCHIC LIFE OF MICROÖRGANISMS.—*The Open Court* for July 11, publishes the reply of George John Romanes, LL.D., F.R.S., to the criticisms of M. Alfred Binet on his psychological work in its relation to microörganisms.

THE CHICAGO POLICLINIC.—The following

well-known physicians have been added to the Faculty: Dr. J. H. Etheridge as Professor of Gynecology, and Dr. F. D. Porter as Professor of Medicine.

A NEW HOSPITAL.—The Michigan State Legislature recently appropriated $50,000 for the erection of a new hospital at Ann Arbor. The citizens have just supplemented that amount by voting to issue bonds for $25,000.

A MEDICAL EPISODE AT YALE.—At the recent Yale Commencement two of the favored guests took snap shots at the profession of medicine. Mr. Depew manufactured the following: "I once knew a doctor who secured board with an undertaker because he thought that it would improve his business. He said he always knew when the undertaker's business was good, for then there was ice on the butter and flowers on the table."

It is interesting to note the conspicuous ability of Mr. Depew, the great after-dinner undertaker, to grapple with the financial problems involved in such *grave-undertakings*.

Mr. Clemens (Mark Twain) aimed his alleged wit "against the doctors," who, he says, have reduced their labors and increased their charges: "The doctor of to-day does not cart his medicines 'round in a wagon, but carries them in a portmonnaie; he puts three drops of nothing in a glass of water and asks you to furnish the water; a month later you will find the water charged in the bill and you will have to pay for it, too."

As men are willing to pay liberally for novelties, we think Mark should pay for the water.

On the same occasion Mark Twain accused President Gilman, of Johns Hopkins University, of having neglected the rudiments of his education, especially spelling, since he did not know how "to spell 'John' correctly."

Mark is the last man that should criticise, since he has always contended that orthography was one of the "*liberal arts*."

FOREIGN.

IN INDIA the Legislative Council has drafted a bill on the leprosy question—including segregation and medical care.

IN AUSTRALIA the Medical Society of Victoria and the Victorian Branch of the British Medical Association recently met to discuss the Bill to amend the Medical Practitioners' Act of 1865, when it was resolved to support the Bill. The number of insane persons in South Australia on Dec. 31, 1888, was 758—430 males and 328 females.

IN CHILI the Government has created a "Superior Council of Public Hygiene," consisting of seven members, whose duty it shall be to advise the Government in everything that relates to the public health throughout the Republic. The Council has a laboratory for chemical analysis under its control.

IN RUSSIA, at a recent meeting of the St. Petersburg Deutscher Aertztlicher Verein, Dr. Magawly cited three cases of double central amblyopia, in two men and a boy, caused by looking at an eclipse of the sun with unprotected eyes. After a prolonged stay in a dark room and subsequent wearing of dark protecting spectacles all the patients permanently recovered their sight.

IN GREAT BRITAIN we glean from our exchanges several items of interest. Lord Randolph Churchill will introduce a draft Bill in the House of Commons for the amendment of the constitution of the College of Surgeons. Sir James Paget has been addressing the citizens of Oxford in support of the extension of the Eye Hospital of that city. The common iliac artery was ligatured for a large and rapidly increasing aneurism of the external iliac, by Mr. Clement Lucas, in Guy's Hospital, recently; the patient is doing well, the circulation being well maintained in the foot. The Council of the Royal College of Surgeons in Ireland has passed a resolution congratulating Sir George Porter on the honor conferred on him by the Queen, and through him to the College of Surgeons. Sir George was recently created a Baronet.

CELLULOID MANUFACTURE DANGEROUS.—The French Government has ordered an official investigation into the dangers to life and other interests attending the making of celluloid. During two years three accidents, in each case having occasioned serious injury and loss of life, have occurred at factories making this inflammable material. It is manifest that some form of restriction, as to locality, must be ordained for this kind of work. The process of making this substance involves the use of a considerable proportion of gun-cotton, which is too explosive and inflammable to be permitted to be used in thickly settled neighborhoods.

SOCIETY PROCEEDINGS.

AMERICAN MEDICAL ASSOCIATION.

Official Report of the Fortieth Annual Meeting.

The American Medical Association convened at Music Hall, Newport, Rhode Island, on June 25, 1889, at 11 A.M.

The Chairman of the Committee of Arrangements, DR. H. R. STORER, called the meeting to order and introduced the Rev. Thatcher Thayer, D.D., who invoked the blessing of the Almighty upon the Assembly. Dr. Storer then announced the programme of the entire session and the location of the halls for Sections.

The President, Dr. W. W. Dawson, Ohio; Vice-Presidents, Drs. W. L. Schenck, Kansas; Frank Woodbury, Penna.; Henry O. Walker, Mich.; the Permanent Secretary, Dr. William B. Atkinson, Penna.; the Assistant Secretary, Dr. V. M. Francis, Rhode Island; the Treasurer, Dr. Richard J. Dunglison, Penna., were present.

On motion, reading of the list of members registered was omitted.

Letters of regret from several members of the United States Cabinet and others were read by the Chairman of the Committee of Arrangements.

Invitations were read and accepted for the members to visit the various public buildings, Fort Adams, Fort Wolcott, the U. S. Naval Torpedo Station, the U. S. Naval Training School, the U. S. Life-Saving Station, the Historical Society's building, the Redwood Library, the Newport Hospital, etc.

His Excellency, Herbert W. Ladd, Governor of Rhode Island, welcomed the Association in a brief speech, and was followed by Dr. James H. Eldredge, an Ex-President of the State Medical Society of Rhode Island.

(See page 14.)

The deaths of Dr. F. H. Rehwinkle, Chairman of the Section of Dental and Oral Surgery, and of Dr. J. B. Hunter, of New York, were announced.

On motion, all the physicians of Newport not otherwise entitled to be present were made members by invitation.

Reference having been made to the failure to obtain reduced rates on the railroads, on motion of Dr. J. C. Culbertson, the subject was referred to a special Committee consisting of Drs. Culbertson, W. L. Schenck and J. H. Musser.

The Address of the President, Dr. W. W. Dawson (see page 1), was read by Dr. J. A. Larrabee, of Ky., as Dr. Dawson was suffering from an affection of his eye.

Vice-President Dr. W. L. Schenck occupied the Chair.

On motion of Dr. W. Brodie, of Mich., a vote of thanks was tendered to the President for his very able and interesting Address, and it was referred for publication.

On motion of Dr. A. L. Gihon, U. S. Navy, the President was requested to telegraph to the venerable Dr. D. Humphreys Storer, of Boston, an Ex-President of the Association, a filial greeting and regret that he was absent from the meeting.

On motion, the Association adjourned until 10 A.M. on Wednesday.

SECOND DAY, JUNE 26.

The President called the meeting to order at 10 A.M.

Prayer was offered by Right Rev. Thomas M. Clark, the Episcopal Bishop of Rhode Island.

After some announcements by the Committee of Arrangements, the President announced that the Committee on Railroads would meet for a consultation and report on Thursday.

The Permanent Secretary read the names of the Nominating Committee, as follows:

Ark., P. O. Hooper; Col., J. W. Graham; Conn., J. A. Stokes; D. C., Dewitt C. Patterson; Ga., J. B. S. Holmes; Ill., J. S. Marshall; Ind., S. J. Cook; Ia., W. F. Peck; Kan., J. E. Minney; Ky., J. M. Mathews; La., J. L. Bland; Me., F. Hitchcock; Md., John Morris; Mass., E. H. Warren; Mich., W. Brodie; Minn., John H. Murphy; Mo., Isaac N. Love; Miss., J. D. Dabney; N. J., W. Perry Watson; N. H., L. G. Hill; N.Y., E. D. Ferguson; N. C., W. J. Jones; Neb., J. O. Carter; Ohio; W. S. Christopher; Penna., W. H. Parish; R. I., J. L. Collins; S. C., S. M. Orr; Tenn., G. C. Savage; Texas, A. Van Gasken; Va., L. Robinson; Vt., H. D. Holton; W. Va., ———; Wis., W. T. Galloway; U. S. Army, G. Smart; U. S. Navy, J. L. Neilson; U. S. Marine-Hospital Service, W. H. Long; Utah, J. F. Bascom; New Mexico, W. H. Ashley.

On motion, this Committee was instructed to meet immediately.

Dr. Wm. Pepper, of Penna., then delivered the Address in Medicine, which will appear in full in THE JOURNAL.

Dr. A. L. Gihon, Chairman, read an Appeal on behalf of the Rush Monument, which will be published in the same issue with Dr. Pepper's address.

The Permanent Secretary read a reference from the Section on Gynecology, asking that the paper by Dr. Storer on "The Medals of Dr. Rush," be read before the General Session at this time. This was granted.

On motion of Dr. M. L. Herr, of Penna., it was agreed that one member of each County Medical Society in the Union be appointed to solicit funds for the monument. A recess was taken to permit the members to make their offer-

ings to the fund, which resulted in the collection of $264.50.

The amendments to the Constitution and By-laws being in order a motion of Dr. A. Garcelon, of Maine, to postpone them until Thursday was negatived. The amendment to strike out the last clause of or paragraph of Sec. 7, relating to individually affixing names to the Constitution and Regulations of this Association was adopted after a full explanation of its purport by Dr. N. S. Davis.

Vice-President Dr. F. Woodbury in the Chair.

Dr. Culbertson moved that the whole matter of the other amendments be referred to the Board of Trustees, with the Secretary.

On motion of Dr. J. B. Murdoch, Penna., this was laid on the table.

The next amendment proposing many changes in the Sections was taken up and Dr. N. S. Davis moved to postpone all except the first paragraph. After some further discussion, on motion of Dr. Larrabee to lay this on the table and indefinitely postpone, it was carried by a large majority. A motion to reconsider this action was, on motion of Dr. Gihon, laid on the table.

The amendment providing for a General Committee, or Council, was next considered. A motion by Dr. C. R. Earley, Penna., to indefinitely postpone the entire subject was lost. After much discussion by Drs. Davis, Larrabee, Murdoch, Scott, Vaughan, Millard, Connor, Quimby, Edw. Jackson and Baldy, the amendment was rejected.

The Permanent Secretary read the following communication from the Section on State Medicine:

Resolved, That the American Medical Association is of opinion that it is a duty devolving on all Nations to take measures to eradicate any plague centre from their territory, that the existence of such plague centres is a menace to all other Nations, and that our State Department be requested to take measures through proper diplomatic channels for the conveyance of this opinion to the Government deemed obnoxious to the opinion as herein expressed.

On motion the action was accepted.

On motion the Association adjourned until Thursday at 10 A.M.

THIRD DAY, JUNE 27.

The President called the Association to order at 10 A.M. Prayer was made by Rev. Jas. Coyle, of Newport.

After announcements by the Committee, Sir James Grant of Canada, and Dr. H. I. Bowditch, were invited to seats on the platform.

Dr. Grant responded to the invitation by a speech, in which he reviewed the valuable work done by the members of the profession in the United States. (See page 84.)

Dr. P. O. Hooper, of the Board of Trustees, read their report, showing the work done in publishing THE JOURNAL, the property on hand, etc., and that THE JOURNAL was now free from debt.

REPORT OF THE TRUSTEES FOR THE PUBLISHING OF THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, FOR THE YEAR ENDING JUNE 30, 1889.

The trustees of the American Medical Association for the publication of its Transactions in Journal form, beg leave to make their annual report.

THE JOURNAL, as is well-known to the members, is now within a few days of having compleated its twelfth volume and sixth year of publication. The wisdom of the change from an annual volume containing simply its Transactions to that of a weekly issue embracing the papers read before the Association, and such other contributions of interest as its editor may select, is conspicuously apparent, and has the fullest indorsement of the Association.

It is observable that since the starting of THE JOURNAL, the attendance at the annual meetings have been better, and the dues from absent members have been more generally paid, and thereby our income increased from less than $5,000 in 1883 to over $15,000 in 1889. The report of the Treasurer will show in detail the financial condition of the Association which is that of THE JOURNAL. From the beginning of the enterprise it has been the desire of your Trustees, in addition to the publication of the Transactions of the Association, to produce a first-class medical journal. The plant, or means placed at the disposal of the Trustees, was at first very diminutive and tender, and had to be fostered with the greatest care and economy, that we might have a journal of any kind. The Trustees were ably assisted in this delicate and arduous duty by the zeal and ability of the editor—the father, patron and friend of this Association. He has received our thanks, and deserves your hearty commendation for the very valuable services he has given to its establishment.

From the small and uncertain resources available at the beginning, this journal has now attained a sound financial basis, and is to-day the equal, if not the best in the country, and with greater means at our disposal, and the services of a more complete corps of writers which can then be employed, we expect to place it in the very front rank of medical periodicals.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION is now honored and everywhere respected, and its location coveted by various cities, publishers and commercial interests.

It has won this high position by its just and independent course, having no enemies to punish or personal interests to serve. In its course it has been, is, and will continue to be loyal to the med-

ical profession and the best interests of the American Medical Association.

From the report of the acting editor for the JOURNAL year ending March 31, 1889, the Trustees make the following extracts which concisely presents the main facts:

Weekly and Total Circulation.—At this date, March 31, 1889, the regular weekly circulation of THE JOURNAL is 4,633, of which 4,309 go to members and subscribers, and 324 to exchanges, foreign and domestic, and advertisers. The total number printed each week is 5,000 copies being 367 in excess of the number required for the regular mail and express lists. An average of 75 are lost by spoilage, as many more go for extra copies to contributors, leaving on file about 200 copies out of which to supply samples, and single copies to complete files of members, when called for. In addition to the regular weekly issues, an extra edition of 20,000 copies was printed in April, 1888, and distributed as sample copies to members of the profession not previously receiving THE JOURNAL, which made the total number of copies of THE JOURNAL circulated during the year 275,000.

Receipts.—As all membership dues are paid to the Treasurer of the Association, only the money paid for subscriptions, advertisements, reprints, extra journals, etc., is received at the office of publication. From the sources just named there has been received at this office during the year ending March 31, 1889: From subscribers, $2,-182.53; from advertisements, $9,731,60; for reprints, $844.37; from sale of extra Journals, Codes of Ethics, and Volumes of Transactions, $77.75; for rent of part of printing office, $150; and for bindery work for outside parties, $1,317.71; making a total of $14,303.96, all of which has been paid to the Treasurer of the Association direct, or through the Treasurer of your Board.

Publication Expenses.—The total publication expenses for the year ending March 31, 1889, for office rent, materials and labor in printing office and bindery, are $19,808.65; from which should be deducted $1,317.71 cash received for work done in the bindery for outside parties, and $150 for storage use of part of printing office, leaving the actual publication expenses of THE JOURNAL for this year, $18,340.94.

Under the head of *Editorial Expenses* are included the salary of the Editor, payments for Foreign and Domestic Correspondence, the Reports of Medical Societies, Lectures and Papers, and for Assistant Editorial work. The total amount drawn from the Treasury on account of these items during the year ending March 31, 1889, is $4,534.38; of which $1,500 was paid to the Editor for the first nine months of the year, $333.33 for the month of January, 1889, and the remaining $2,701.05 for the other items named. It is thus seen that the total current expenses on account of THE JOURNAL, both publication and editorial, for the year ending March 31, 1889, are $22,875.32.

Expenditures on Account of Plant and Fixtures.—In accordance with the recommendation contained in my report for 1888, which were sanctioned by your Board, $720.33 was paid for new type, which enabled us to commence Volume XI, July 1, 1888, with an entire new typographical dress and a better quality of paper. To facilitate the work and economize the cost of folding, stitching, wrapping, etc., $500 was paid for a wire stitching machine to complete the bindery part of the office.

Property on hand.—The present property belonging to the Publication Department may be stated as follows:

Printing office, type, fixtures, etc.	$1,477.94
Bindery	650.21
Business office—safes and furniture . . .	185.75
	$2,313.90

There are stored in the printing office, at the request of the Treasurer of the Association, 1,149 volumes of the Annual Transactions of the Association, issued during the years prior to the establishment of THE JOURNAL, of estimated value $2,870. About 25 copies of volumes five and six, 75 copies of volumes seven and eight, and 150 copies of volume nine, ten and eleven of THE JOURNAL remain on hand, and 3,000 copies of a cheap edition of the Code of Ethics.

COMPARATIVE TABLE

Showing the Relative Quantity of Reading Matter in the Five Leading Weekly Medical Journals of the United States:

NAME.	No. of Pages.		Average No. of Words.		Less Words than The Journal in 52 Issues.
	In each Issue.	In 52 Issues.	In each Issue.	In 52 Issues.	
The Boston Medical and Surgical Journal.	24	1,248	26,311	1,368,172	439,728
The Medical News of Philadelphia	28	1,456	27,128	1,410,656	387,244
The Medical Record of New York.	28	1,456	32,640	1,697,280	100,620
The New York Medical Journal	28	1,456	32,939	1,712,828	85,072
THE JOURNAL.	36	1,872	34,575	1,797,900	. . . . .

The present status of THE JOURNAL in regard to the number of its pages, exclusive of advertisements, and the actual amount of reading matter, in comparison with the four principal weekly medical journals published in this country, is well shown in the foregoing table, prepared by Mr. J. Harrison White, the business manager of our printing and publication office.

A special edition of THE JOURNAL, of 75,000 copies, was issued in May, and one addressed to every physician in the United States and Canada. The expense of this edition was fully covered by the receipts from the advertisements obtained for this special number, and left a slight balance in the treasury. The good result of this enterprise is already apparent at the office of publication.

At the beginning of the year the number of pages of THE JOURNAL was increased from 32 to 36. This of course carried with it a considerable increase of expense, but we are glad to be able to state that we will close the year free from debt, and are now in possession of a better plant for producing an acceptable journal than at any former period.

All of which is respectfully submitted by the Board of Trustees.

P. O. HOOPER, J. M. TONER,
LEARTUS CONNOR, W. T. BRIGGS,
E. M. MOORE, JNO. H. HOLLISTER,
A. GARCELON.

On motion the report was adopted.

The Permanent Secretary read the following from the American Social Science Association:

Resolved, That a committee of three be appointed by the President of this Association, to draw up a suitable resolution, indicative of the sense of this body, upon the necessity of a rigid demand on the part of our medical institutions for a more thorough general education antecedent to the study of medicine; suggesting the adoption of entrance examinations for those candidates not possessing a collegiate or university degree, and furthermore urging our medical colleges so to extend the course of study and increase their facilities that the standard of scholarship may be on a par with like institutions abroad.

Resolved, That the same committee draw a resolution which may be presented to the legislative bodies of the respective States, urging the necessity of formulating more stringent laws to guard against the further incorporation of bodies unqualified to properly teach the science of medicine, and to take such steps that all the incorporated medical colleges be subject to a State supervision as to their methods and the standard of instruction.

Resolved, That a copy of these resolutions be presented to the American Medical Association.

On motion of Dr. F. Woodbury the communication was accepted.

Dr. P. S. Conner, Ohio, read the Address in Surgery (see page 15).

On motion of Dr. Brodie thanks were offered Dr. Conner for his address, and it was referred for publication.

The Permanent Secretary read the

REPORT OF THE TREASURER.

I have the honor to report, as Treasurer, that there is a balance in the Treasury of the Association at this date of $2,845.65, as shown by the itemized statement which will accompany this report, and be published at length in THE JOURNAL of the Association for the information of members.

There is nothing of special interest to report at this time in connection with the financial relations of the Association, except the statement, which must forcibly address itself to all who have at heart the onward progress of the Association, that the Treasury has never yet, since the establishment of THE JOURNAL; or, indeed, at any time during the twelve years in which I have had the honor to occupy the position of Treasurer, failed to respond to all authorized and legitimate demands upon it for the interest and advancement of the Association and the maintenance of its now well established journal.

All of which is respectfully submitted.

RICHARD J. DUNGLISON, Treasurer.

DR. RICHARD J. DUNGLISON, Treasurer, in account with the American Medical Association:

DR. 1888.		
May 9. To cash balance, as per report at Cincinnati meeting		$2,407.83
May 9. To amount received from delegates and members at Cincinnati meeting		4,340.00
1889.		
June 22. To amount of annual dues from members to date		10,465.00
To amount received from office of publication to date		16,585.81
		$33,798.64

CR. 1888.	
May 10. By exchange and collection charged on checks and drafts deposited at Farmers' and Mechanic's Bank, Philadelphia	$43.55
May 24. By postage and collection charges, stamped envelopes and postal cards	104.38
May 25. By cash paid Dr. Richard J. Dunglison, Treasurer, expenses of travel, expressage, telegrams, etc.	79.00
June 1. By cash paid Dr. William B. Atkinson, Permanent Secretary, expressage, postage, traveling expenses, etc.	161.78
June 5. By cash for postage, rental of P. O. Box, envelopes, etc.	22.81
June 11. By cash paid Dr. W. W. Dawson, Chairman Com. of Arrangements, for rental of hall, printing, etc.	1,163.40
June 14. By cash paid William F. Fell & Co., printing, postals, slips, circulars, receipts, etc.	16.25
June 14. By cash paid Dunlap & Clarke, printing drafts, cards, circulars, etc., 1887–1888.	29.50
June 19. By cash paid Geo. S. Davis, subscription to Index Medicus, 1887–1888.	20.00
June 27. By cash paid to Altemus & Co. for stationery	9.00
July 2. By cash for collector's commissions, stationery, postage, etc., to date	53.73
July 19. By cash to Dunlap & Clarke, printing cards, slips, circulars; stamped envelopes	21.25
Aug. 3. By cash to Dunlap & Clarke, printing remittance blanks and postal receipts	10.25
Aug. 3. By cash paid collector's charges and commissions, stamped envelopes, rental P. O. Box, etc	46.64
Sept. 8. By cash paid 1,000 two-cent envelopes	22.20
Sept. 13. By cash paid Wm. J. Dornam, printing credentials	4.95
Oct. 17. By cash to P. C. Merry, for hauling books for Librarian at Washington	5.00
Oct. 18. By cash paid Wm. F. Fell & Co., printing postal cards, membership receipts, drafts, etc.	12.50
Oct. 20. By cash paid for postage, stationery, collector's commissions, stamped envelopes, etc	60.64
1889.	
Jan. 19. By cash paid Wm. F. Fell & Co., printing envelopes, cards, etc.	16.25
March 20. By cash paid Ward & Barnitz, printing postals, receipts, etc.	4.75
March 30. By cash to Wm. F. Fell & Co., envelopes, slips, cards, etc.	10.00

April 12. By cash paid Dr. C. H. A. Kleinschmidt, Librarian, express charge on books,	8.70
May 6. By cash for postage, stamped envelopes, postals, rental of P. O. Box and collector's charges.	117.67
June 5. By cash for postage, telegrams, slips, collector's commissions, etc	16.05
June 8. By exchange and collection charges, on checks and drafts deposited at Farmers' and Mechanics' Bank, Philadelphia.	42.37
June 24. By cash paid for publication expenses of the Journal of the Association to June 15, 1889.	22,322.58
June 24. By cash paid for editorial work on the Journal of the Association to June 15, 1889.	6,527.79
June 25. Cash Balance.	2,845.65
	$33,798.64

This certifies that we have examined the accounts and vouchers of R. J. Dunglison, Treasurer American Medical Association, for the year ending June 24, 1889, and find them correctly cast and properly vouched.

ALONZO GARCELON,
W. T. BRIGGS,
Auditing Committee.

Newport, June 26, 1889.

Also the report of the Auditors.

The undersigned, Auditing Committee of the American Medical Association, beg leave to report that they have attended to the duty devolving upon them and, after close inspection of the bills for the publication of THE JOURNAL of the Association and other expenses pertaining thereto, find that there has been paid into the Treasury of the Association during the year ending June 26, current, the sum of $33,798.64, and that there has been expended the sum of $30,952.99, leaving an unexpended balance of $2,845.65, and that for these expenditures the Treasurer holds bills duly authorized and receipted.

ALONZO GARCELON,
W. T. BRIGGS,
Com. for Auditing Accounts.

On motion these were accepted.

The venerable George Bancroft, the historian, having entered on the stage, he was presented to the members, who arose to receive him.

Dr. P. O. Hooper, from the Committee on Nominations, read the following:

REPORT OF THE COMMITTEE ON NOMINATIONS.

To the President and Members of the American Medical Association:

Your Committee on Nominations have the honor to report that they met yesterday and organized by the selection of Dr. P. O. Hooper, of Arkansas, as Chairman, and Dr. Henry D. Holton, of Vermont, as Secretary. After mature deliberation, they by ballot proceeded to the nomination of the following officers for the ensuing year:

For President—E. M. Moore, of New York.

First Vice-President—J. W. Jackson, of Missouri.

Second Vice-President—H. H. Kimball, of Minnesota.

Third Vice-President—J. H. Warren, of Massachusetts.

Fourth Vice-President—T. B. Evans, of Maryland.

Treasurer—Richard J. Dunglison, of Pennsylvania.

Permanent Secretary—William B. Atkinson, of Pennsylvania.

Librarian—C. H. A. Kleinschmidt, of District of Columbia.

To fill vacancies in Judicial Council caused by expiration of their terms of office—N. S. Davis, Illinois; H. Brown, Kentucky; Wm. Brodie, Michigan; R. C. Moore, Nebraska; G. B. Gillespie, Tennessee; T. A. Foster, Maine; J. B. S. Holmes, Georgia.

To fill vacancies in Board of Trustees of JOURNAL—P. O. Hooper, Arkansas; Alonzo Garcelon, Maine; Isaac N. Love, Missouri. For the unexpired term of E. M. Moore—W. W. Dawson, Ohio.

To deliver the Address on *General Medicine*—N. S. Davis, Illinois.

To deliver the Address on *General Surgery*—Hunter McGuire, Virginia.

To deliver the Address on *State Medicine*—Alfred L. Carroll, New York.

For Members of the Committee on State Medicine—Alabama, Jerome Cochrane; Arkansas, Edwin Bentley; California, G. G. Tyrrell; Colorado, J. Wood; Connecticut, J. C. Kenny; Dakota, F. P. Kenyon; District of Columbia, D. W. Prentiss; Delaware, L. Bush; Florida, J. Y. Porter; Georgia, J. P. Logan; Illinois, J. H. Rauch; Indiana, F. W. Beard; Iowa, A. B. Bowen; Kansas, W. L. Schenck; Kentucky, J. N. McCormack; Louisiana, J. J. Bland; Maine, T. J. Foster; Maryland, T. A. Ashby; Massachusetts, H. P. Walcott; Michigan, H. B. Baker; Mississippi, Wirt Johnson; Missouri, H. H. Mudd; Minnesota, Perry H. Millard; North Carolina, T. F. Wood; Nebraska, J. O. Carter; New Jersey, I. N. Quimby; New York, T. M. Flandrau; New Hampshire, D. S. Adams; Ohio, C. G. Comegys; Oregon, W. D. Baker; Pennsylvania, W. T. Bishop; Rhode Island, H. R. Storer; New Mexico, F. H. Atkins; South Carolina, H. T. Horlbeck; Tennessee, J. Berrien Lindsley; Texas, J. Sears; Vermont, D. F. Rugg; W. Virginia, G. W. Baird; Virginia, — Ashton; Wisconsin, J. T. Reeve; Utah, F. S. Bascomb; U. S. Navy, W. D. Wolverton; U. S. Army, F. C. Ainsworth; U. S. Marine-Hosp. Service, J. A. Kinyoun.

Committee on Necrology — Alabama, G. E. Ketchum; Arkansas, L. P. Gibson; California, R. H. Plummer; Dakota, F. M. Crain; Connecticut, W. G. Brownson; District of Columbia, A. N. Acker; Florida, Neal Mitchell; Georgia, P. R. Courtleroy; Illinois, D. W. Graham; Indiana, J. F. Hubbard; Iowa, J. B. Ingals; Kansas, Chas. Gardner; Kentucky, H. M. Skillman; Louisiana, J. R. Matas; Maine, A. J. Fuller; Maryland, F. S. Latimer; Massachusetts, G. M. Garland; Michigan, G. E. Ranney; Mississippi, — Trimble; Missouri, J. E. Kefft; Minnesota, W. W. Mayo; New Mexico, W. R. Tipton; Nebraska, — Galbreth; New Jersey, J. D. Hough; New York, John W. Brown; New Hampshire, J. W.

Parsons; Ohio, S. P. Deahofer; Oregon, — Shackelford; Pennsylvania, J. B. Walker; Tennessee, J. B. Murphy; Texas, W. Park; Vermont, E. R. Campbell; Virginia, M. L. James; W. Virginia, W. L. Wilson; Wisconsin, — Mackie; U. S. Navy, W. T. Hord; U. S. Army, J. R. Smith; U. S. Marine-Hosp. Service, Fairfax Irwin.

Committee to appoint Alternates in case any Vacancies occur in the Number selected to give a General Address—Wm. Brodie, J. H. Murphy, J. T. Morris.

Your Committee name as the place of next meeting Nashville, Tenn., and the time of meeting as the third Tuesday of May, 1890.

Chairman of Committee of Arrangements—W. T. Briggs.

Assistant Secretary—G. C. Savage, Nashville.

(Signed) P. O. HOOPER, Pres.
HENRY. D. HOLTON, Sec.

On motion, the report was unanimously adopted and these officers were elected for 1890.

Dr. Culbertson, from the special committee on transportation of members to the sessions of the Association, reported a resolution making it the duty of the Permanent Secretary to secure from all railroads or other means of travel the lowest passenger rates for the sessions of the Association.

After discussion this was adopted.

On motion of Dr. Frank Woodbury the following preambles and resolution were unanimously adopted:

WHEREAS, It is of the utmost importance that the people of this country should enjoy the same advantages from the advances in materia medica, chemistry and pharmacy that are possessed by the people of Europe and other favored nations, and

WHEREAS, The patent laws of the United States appear to be so construed as to protect the foreign manufacturers and purveyors of chemical products, and to discriminate against domestic manufacturers by creating monopolies in the supply of certain new and valuable drugs; therefore be it

Resolved, That the American Medical Association hereby most respectfully petitions the Congress of the United States to instruct the appropriate committees to investigate this subject, to take testimony of any such discrimination, to compare the legislation on this subject of the leading Governments of Europe and the practical working of our own laws upon copyright, trade-mark, and any other protection afforded to foreign manufacturers of drugs in frequent use or to be used in the treatment of the sick, and to report such action as it may deem advisable to correct any abuses or injustice to American citizens, if they find such abuse or injustice really exists.

The following was offered by the Section on Ophthalmology:

Resolved, That the Ophthalmological Section respectfully desires the Association to authorize this Section to use what influence it can command to induce the Census Committee of the United States for 1890 to extend the tables relative to the blind and to tabulate to the greatest extent possible the causes of blindness.

On motion this was adopted.

The Section on State Medicine offered the following:

This Section has adopted the following Report of the Committee on Uniform Medical Legislation in the United States, and recommend that it be adopted, and that the Secretary of the Association transmit a copy of the Report to the Secretary of each State Medical Society, with the recommendation that each Society exert itself to secure the enactment of a law embodying the provisions of the Report.

Gentlemen of the Section on State Medicine:

Your Committee on Uniform Legislation have the honor to submit the following:

That, in our judgment, the best interests of the public will be subserved by the enactment of efficient medical legislation in every State in the Union.

That for the convenience of the profession and the stimlating effect on medical education in this country it is advisable to secure uniformity of legislation in the essential features of all Medical Practice Acts.

This Committee, therefore, begs to recommend as follows—that in future medical legislation the essential features of the enactment be as follows:

That all persons commencing the practice of medicine in any of its branches shall possess a license from the State Board of Medical Examiners.

That all candidates for a license shall submit satisfactory documentary evidence that he or she is a graduate in medicine of a medical institution in good standing with the said Board and having a curriculum possessing at least the following requirements:

First.—An entrance examination to test the student's fitness to become a practitioner. This examination shall include at least an examination in English grammar, composition, geography, history, arithmetic, algebra, physics, and the natural sciences; together with at least one of the following languages: Latin, French, or German, provided, however, that graduates of reputable colleges may be exempt from said examination.

Second.—Before granting a degree of M.D. or M.B., candidates for same shall have attended at least three full and regular courses of medicine of not less than six months' duration each.

All candidates for a license shall undergo an examination by the said Board of Medical Examiners upon the branches usually taught in medical colleges. Said examination shall be both scientific and practical, but of sufficient severity to test the candidate's fitness to practice medicine and surgery.

Said Board of Medical Examiners shall issue a license to only such persons undergoing an examination as may be deemed suitable persons to practice medicine. Said Board may refuse or revoke a license for the following named causes, to-wit: chronic and persistent inebriety, criminal abortion, or gross unprofessional conduct.

All licenses shall be recorded and made a matter of public record with the County Clerk, or Clerk of District Court, in the county wherein resides said person.

Said Board of Medical Examiners shall be appointed by the Governor, for a period not exceeding five years, the members thereof to be chosen from among the reputable practitioners of medicine of the State of not less than five years' residence.

On motion, the report was adopted.

The same Section offered the following:

It is recommended by the Section on State Medicine that the Committee on Collective Investigation of Disease, at present included in the Standing Committee on Meteorology, be discharged, and that the Committee on Meteorology be continued, with the direction to report to the Section on State Medicine at the next annual meeting of the Association.

On motion, this was adopted.

Dr. Frank Woodbury offered the following, which, on motion, was adopted:

WHEREAS, The American Pharmaceutical Association has appointed a Committee of Conference and sent a delegation to this Association,

Resolved, That this Association extends a cordial greeting to the representatives of the American Pharmaceutical Association, and invites them to a seat upon the platform, and

Resolved, That a Committee of Conference be appointed to meet the Committee of the American Pharmaceutical Association, for the consideration of subjects of mutual interest and benefit.

Resolved, That this Committee report on the second day of the next annual meeting of this Association the result of their conference, with such recommendations as they may deem advisable in the premises.

The Permanent Secretary read the following:

Your Committee on Dietetics beg leave to report: The special topic referred for investigation has been entertained and partially discussed at this session, but not so fully as to warrant a report at this time that will completely satisfy all the requirements of the subject. We therefore report progress and ask that the Committee be continued.

(Signed) E. A. WOOD, Chairman.

The report was received and the Committee were continued.

Dr. A. L. Gihon offered the following amendment to the By-laws:

That the first day of the meeting of this Association shall be on the first Wednesday of May or June, respectively, instead of Tuesday.

Laid over until next meeting.

The Section on Practice of Medicine offered a resolution, that the President appoint three delegates to attend the Convention to revise the Pharmacopœia, which meets in May, 1890. This was adopted.

The Association adjourned until Friday at 10 A.M.

FOURTH DAY, JUNE 28.

The President called the Association to order at 10 A.M.

Prayer was made by Rev. D. A. Jordan.

Dr. Storer in making the final announcements, took occasion to thank the Association for the many kindnesses they had shown the committee.

The Permanent Secretary read the report of the Librarian, which will appear in a future issue, with a recommendation that the usual appropriation of $10 be made for the *Index Medicus*.

On motion of Dr. Davis the report was accepted and the appropriation was made.

The Address on State Medicine was then delivered by Dr. W. H. Welch, of Maryland. (See page 73.)

On motion of Dr. J. B. Hamilton the address was referred for publication, with thanks to the author for his very able, instructive and entertaining paper.

The President appointed as the committee to confer with the Social Science Association Drs. C. G. Comegys, Ohio; J. B. Hamilton, U. S. Marine-Hospital Service, and A. M. Owen, Maryland.

By request of the Section on State Medicine the Committee on Fœticide was discharged.

The President appointed as the committee to confer with the American Pharmaceutical Association: Drs. G. E. Frothingham, Mich.; J. C. Culbertson, Ohio; Frank Woodbury, Pa.; Isaac N. Love, Mo.; F. C. Shattuck, Mass.

As the delegates to the Convention for revision of the Pharmacopœia: Drs. H. A. Hare, Pa.; N. S. Davis, Jr., Ill.; Elmer Lee, Mo.

Dr. X. C. Scott, Ohio, offered an amendment to the By-laws abolishing the Committee on State Medicine inasmuch as the Section on State Medicine occupies the entire ground.

This will lie over till next year.

On motion of Dr. N. S. Davis, the President was requested to appoint a committee to take charge of the procuring excursion rates, and to select the most feasible route to the Tenth International Medical Congress in Berlin. Committee: Drs. W. H. Pancoast, Pa., J. B. Hamilton, D. C., A. N. Bell, N. Y., A. H. Beidler, Md.; N. S. Davis, Ill.

The Permanent Secretary read the following names as appointed to attend the British Medical Association in Europe during 1889: Drs. A. J. Fuller, Me.; E. Cutter, N. Y.; P. O. Hooper, Ark.; J. H. Knight, Ct.; I. N. Love, Mo.; J. M. Mathews, Ky.; W. C. Wile, Ct.; W. F. Hutchinson, R. I.; A. N. Owen, Ind.; I. N. Quimby, N. J.; J. W. Jackson, Mo.; F. J. Lutz, Mo.; S. E. Solly, Col.; J. F. Noyes, Mich.; J. M. French, Ohio; A. Segur, N. Y.; D. A. Hengst, Pa.; J. Taber Johnson, D. C.; R. H. Plummer, Cal.

To the Canadian Medical Association, Dr. P. S. Conner, Ohio.

To the International Medical Congress to be held in Berlin in 1890: Drs. J. B. Hamilton, D. C.; J. F. Noyes, Mich.; F. Woodbury, Pa.; W. W. Keen, Pa.; A. J. Fuller, Me.; E. Cutter, N. Y.; X. C. Scott, Ohio; W. H. Pancoast, Pa.; W. F. Waugh, Pa.; E. H. M. Sell, Pa.; J. Taber Johnson, D. C.; J. M. French, Ohio; N. S. Davis, Ill.; A. P. Clarke, Mass.; Chas. S. Wood, N. Y.; A. H. Wilson, Mass.; James Collins, Pa.; R. H. Plummer, Cal.

On motion of Dr. J. B. Hamilton, it was resolved that the American Medical Association hereby expresses its profound sympathy with the unfortunate citizens of the city of Johnstown, Pa. and vicinity, and especially with the members of our profession therein residing, and that as a mark of our sympathy the treasurer be instructed to remit the dues for the ensuing year of any member of this Association living in said place.

Dr. J. M. Toner submitted his report as Chairman of the Committee on Necrology.

OFFICERS OF SECTIONS.

The Sections reported their officers as follows:

Practice of Medicine, etc.—J. H. Musser, Pa., Chairman; H. McColl, Mich., Secretary.

Surgery and Anatomy.—B. A. Watson, N. J., Chairman; J. B. Deaver, Pa., Secretary.

Obstetrics and Diseases of Women.—W. W. Potter, N. Y., Chairman; J. Hoffman, Pa., Secretary.

State Medicine.—John B. Hamilton, D. C., Chairman; F. S. Bascum, Utah, Secretary.

Ophthalmology.—S. C. Ayres, Ohio, Chairman; E. J. Gardner, Ill., Secretary.

Laryngology and Otology.—John O. Roe, N. Y., Chairman; Frank H. Potter, N. Y., Secretary.

Diseases of Children.—Isaac N. Love, Mo., Chairman; E. F. Brush, N. Y., Secretary.

Medical Jurisprudence.—T. B. Evans, Md., Chairman; L. Crothers, Ct., Secretary.

Dermatology and Syphilography.—I. E. Atkinson, Md., Chairman; W. T. Corlett, Ohio, Secretary.

Oral and Dental Surgery.—J. L. Williams, Mass., Chairman; E. S. Talbot, Ill., Secretary.

W. B. ATKINSON, M.D., Secretary.

Dear Sir:—It is with great regret that I am compelled to decline the office of Chairman to the Section of Dermatology and Syphilography to which I have been elected. Deeply grateful for the high honor paid me by the Section, I remain, your very obedient servant,

June 27, 1889. I. E. ATKINSON.

Several Sections reported their minutes and papers, which were referred to the Trustees for publication.

On motion of Dr. W. L. Schenck, it was

Resolved, That the thanks of the Association are tendered to Dr. H. R. Storer, Chairman, and the members of the Committee of Arrangements; to the Profession of Newport and of Rhode Island for the courtesies so liberally extended during the session; to His Honor, Mayor Thomas Coggeshall, and the City Council; to Rev. Dr. Thayer, Right Rev. Bishop Clark, Rev. Jas. Coyle, and Rev. D. A. Jordan; the Trustees of the Newport Hospital; the Newport Historical Society; the Redwood Library; the People's Library; the Rev. Rabbi Mendes; the Trustees of the Channing Memorial Church; Mr. H. Bull, Jr., for the use of the Opera House: the Business Men's Association; Capt. J. Waters, Asst. Sup't Third Life Saving Station; Commander C. F. Goodrich, U. S. Navy; Commander F. J. Higginson, U. S. Navy; Col. John Mendenhall, U. S. Army; to His Excellency, Herbert W. Ladd, Governor of Rhode Island; the Rhode Island Medical Society; Hon. Geo. Bancroft, who gave 400 roses for every lady accompanying the delegates; the Medical Faculty of Harvard University; and to Lewis Brown, the Postmaster of Newport.

Dr. W. H. Pancoast offered a vote of thanks to Sir James Grant, M.D., of Canada, for his admirable address and desire to express our pleasure in having him with us. We will always welcome cordially our British Medical brethren.

This was carried by a rising vote.

Sir James Grant replied to the sentiment.

The President elect having been called away, his installation was necessarily postponed.

President Dawson then arose and declared the Association adjourned to meet in Nashville, the third Tuesday in May, 1890.

W. B. ATKINSON,
Permanent Secretary.

DOMESTIC CORRESPONDENCE.

LETTER FROM NEW YORK.

(FROM OUR OWN CORRESPONDENT.)

Dr. Jacobi reads some Notes on the Baking of Bacilli, at the Academy of Medicine—Dr. John C. Peters reports for the Committee on Croton Water Nuisances—Mr. R. H. Robertson exhibits and describes the plans of the New Academy Building—Commencement Exercises at the College of Physicians and Surgeons—The Presidency of the Board of Health—The Election of Dr. E. M. Moore, of Rochester, N. Y., as President of the American Medical Association, received with enthusiasm.

It was not expected that there would be any scientific exercises at the last meeting of the Academy of Medicine before the summer vacation, but on account of special circumstances and the importance of the subject, Dr. Jacobi was given the privilege of reading some "Notes on the Baking of Bacilli." It will perhaps be remembered, in this connection, that a few months ago Dr. Louis Weigert's hot air inhalation apparatus was exhibited at a meeting of the Section on Practice of the Academy, and a very rose-colored account given of the wonders accomplished by it. Having stated that of late the inhalation of dry hot air in pulmonary tuberculosis had attracted considerable attention, Dr. Jacobi made some remarks strongly condemnatory of all pat-

ented apparatuses and processes in medicine; and then went on to say that Weigert's apparatus, which has been patented, was quite imperfect in its mechanical construction and, in addition to its other objections, was sold at a very high price.

He stated that the attention of the profession was first directed to the use of dry hot air in phthisis by Dr. Louis Halter, in an article published in two numbers of the *Berliner Klinische Wochenschrift* in September, 1888, and accompanied by a representation of an apparatus which he had devised. Halter's attention was first drawn to the matter by the exemption of lime-kiln workers from tuberculosis, and his observations, extending over a period of fifteen years, were made in Westphalia, where this disease was very prevalent among the general population. The air about the ovens is quite dry and very hot, the thermometer usually ranging from 122° to 158° F. Such air must, therefore, be for the most part free from tubercle bacilli, which, as is well known, perish at a temperature of from 140° to 149° F. The air about the lime-kilns is also greatly rarefied, and it has the effect in the case of newcomers of increasing the body temperature 2.5° above the normal, while the pulse is raised to 120 to 160, and the respiration to 20 to 80. Old hands, however, perspire very freely, and feel perfectly well.

Another paper on the inhalation of dry hot air in phthisis was also published in the *Berliner Klinische Wochenschrift* in September, 1888, by Dr. E. Krull, and this was also accompanied by a representation of an apparatus devised by the author. It was not until December of the same year that Dr. Louis Weigert published an account of his apparatus in the New York *Medical Record*, and in his communication he made no mention whatever of the articles of Drs. Halter and Krull. About the same time he also exploited his appatus in the public press, proclaiming himself worthy to be considered the equal of Koch by reason of his great invention, by means of which consumption was entirely curable.

Dr. Jacobi then went on to say that he had experimented with the Weigert apparatus to a considerable extent in his wards at Bellevue Hospital, and that the results had not been at all satisfactory. It was true that, in many of the cases, more or less improvement was noted while it was being used; but it was a well established fact that every patient coming to the hospital with phthisis, except the disease is in its last stages, improves for a time after entrance, on account of the nutritious diet, rest, freedom from care, etc. He found by repeated observations that the temperature of the air to be inhaled from the apparatus was always many degrees cooler by the time it had passed through the tube conveying it to the mouth of the patient than it was when it left the cylinder where it was heated. In addition, the temperature of the air was further reduced in the pharynx and trachea, and when the proportionately small amount remaining finally reached the great volume of the blood and was diffused over the extended surface of the lungs, it was still more cooled down. In fact, the expired air was warmer than the inspired air. When it was remembered, furthermore, that the bacilli were located and multiplied deep in the tissues, it seemed hardly probable that they were disturbed at all; and it was not even likely that the soft lung tissue could be heated above normal, while neither the pulse or the general temperature of the body showed any alteration. It was evident, therefore, that in order to destroy the bacilli something more was required than the inhalation of hot air in an ordinary room. The temperature of the apartment in which the inhalations were given ought to be at least 108°. The men working at the lime-kilns mentioned by Halter were subjected to a temperature varying from from 106° to 158°.

Both the hot inhalations and the hot room, Dr. Jacobi said in conclusion, would find their contraindications in all cases where the patients were weak or liable to hæmoptysis, and could only be employed with safety, therefore, where the patient was comparatively robust. He believed, consequently, that this method of treatment should be resorted to only in the very earliest stage of phthisis. In the cases in which he had used the hot inhalations, other causes, as he had mentioned, would account for the improvement where any improvement was noted. In a few he found it difficult to control the cough excited by the treatment, and in two instances it caused so much vomiting, with other disagreeable symptoms, that the patients were decidedly relieved by the discontinuance of the inhalations.

Dr. John C. Peters, chairman of a committee appointed at the last meeting in regard to Croton water nuisances, reported that the committee had made an earnest appeal to the Department of Public Works, which, it seems, is legally responsible in the matter, for the prompt suppression of all nuisances existing along the Croton water shed. The inhabitants of a considerable part of three counties are apparently constantly engaged in polluting the water-supply of New York, and attention has been emphatically directed to the abuse in the report published by the State Board of Health last winter; a thorough investigation having been made during the latter part of last year, in response to an application by Mayor Hewitt to this Board.

A similar investigation was made in behalf of the City Board of Health in 1884. There was much discussion at that time as to what should be done about the matter, and legislation has since been obtained to enable the public authorities to put a stop to the nuisances. It was not reassuring to find, when the result of the investigation of the State Board of Health was pub-

lished, that the nuisance was not only unabated, but had gone on steadily increasing with the growth of villages, the multiplication of summer resorts, and the increase in industries in the valleys of the Croton district. Where Mr. Lucas, who made the former investigation, found 1,879 houses draining into the streams which fed the Croton in 1884, Mr. Brown, the engineer for the State Board of Health, found 2,843 in 1888. Barns and barnyards have also multiplied, and the refuse of a growing population and an increasing number of domestic animals, together with the foul waste of mills and factories, is poured into the Croton water in a constantly swelling volume.

The State Board of Health followed its investigation by formulating "Rules and Regulations for the Sanitary Protection of the Croton River and its Tributaries," but as it had no legal authority to enforce these rules, nothing whatever has been done about the abatement of the nuisance. A determined effort is therefore to be made to induce the Commissioner of Public Works, who alone, under the existing laws, has the power to do so, to take such action as will remove the present sources of pollution and keep the water-supply pure in the future.

On this occasion Mr. R. H. Robertson, the architect, who, by the way, is a son-in-law of Prof. T. M. Markoe, exhibited and described the plans of the new Academy building, which is to occupy a lot 75 feet wide and 100 feet in depth on Forty-third St., near Fifth Avenue. It will be five stories in height, with a gable story, and is to be constructed of brick and a handsome reddish-brown stone known as Longmeadow stone. On the first floor in front are to be a smoking-room 36 by 26 feet and other smaller rooms, and in the rear the large assembly room, 57 by 42 feet, and a handsome dining-room, 31 by 26 feet. These two rooms will be separated by a rolling partition, so that they can be thrown into one at any time when required for large meetings or a largely attended dinner. One and a half stories will be taken up by this part of the building, and the rooms will be 26 feet in height. The half-story in front, 11 feet in height, is to be used for committee-rooms, etc. On the next floor will be the reference library and the stack-room, occupying a story and a half, with three reading-rooms, of less height, in front. The full capacity of the stack-room will be for 230,000 volumes, to accommodate which there will eventually be three tiers of stacks. At first, however, but a single tier will be required by the library. The next floor will be taken up by four section rooms, each with an anteroom and specimen or apparatus room, and accommodating respectively 160, 225, 225 and 110 persons. In the top story, which will not extend over the entire area of the building, will be a microscope room and librarian's apartments, and the rest of the space will be devoted to an open deck, which will probably be fitted up as a summer garden. After the meeting there was a social reunion, with a collation, and the loving cup was passed merrily around.

At the recent Commencement of the College of Physicians and Surgeons the graduating class numbered 166, the largest in the history of the College. Professor James W. McLane, through whose instrumentality the munificent gifts of the Vanderbilts to the institution were mainly secured, has been selected for the Presidency, made vacant by the death of the lamented Dalton, and Prof. T. M. Markoe appointed Vice-President of the College.

Much indignation was felt by the profession at the appointment by Mayor Grant, a short time since, to the Presidency of the Board of Health, of Mr. Charles G. Wilson, a man without experience and, so far as known, utterly without knowledge in sanitary matters, in the place of Mr. Bayles, an expert, and one who has filled the duties of the position in the most admirable manner. This feeling found voice in a resolution introduced at a recent meeting of the Academy of Medicine by Dr. Walter Mendelson, to the effect that, in the opinion of the Academy, the appointment to the Presidency of the Board of Health of any one not specially qualified is fraught with possibilities of the gravest danger to the public health; and furthermore, that the Academy, having at heart the public good, urges the Mayor to reconsider the appointment and, after due consultation with those acquainted with the duties of the office, make a new appointment better suited to the important nature of the department.

In the preamble it is set forth that the Board of Health is a department of the City Government in which every member of the community is most personally and vitally interested, and one where it is absolutely necessary for true efficiency that the presiding officer be acquainted with sanitary science and have a knowledge of the laws of health and of disease; that the medical profession, as guardian of the health of the community, is being brought into daily contact with the workings of the Board of Health, and therefore especially interested in its efficiency; and that the Mayor of the City of New York has appointed to the Presidency of the Board one whose previous experience nowise justifies the belief that he is at all fitted to assume the grave responsibilities of the office intrusted to him.

It was deemed best before submitting the resolution to the vote of the Academy, that it should be referred to the Council for mature consideration, and therefore no definite action will probably be taken in the matter before autumn. There is, however, a growing feeling that the possibility of the appointment of an utterly incompetent President of the Health Department of a city like New

York is an outrage upon the community, and it is probable that urgent efforts will be made to induce the next Legislature to amend the present law in such a way that no one can be appointed to this position who is not a doctor of medicine or an expert in sanitary science. As the law now stands, strangely enough, no physician is eligible to the Presidency, and the great medical profession of New York is entitled to but one representative as Commissioner in the Board of Health; so that our medical men feel that it is time that they should claim some right to proper recognition in a body with which their profession has so much to do and with the interests of which it is so closely identified.

The election of Dr. E. M. Moore, of Rochester, as President of the American Medical Association meets with much enthusiasm here, and, aside from the fact that nowhere in the profession could there be found one more eminently qualified by natural gifts and special culture to fill the position with dignity and grace, it is felt that the selection is in some sense a recognition of the loyalty of that portion of the New York profession which has always stood true to the National colors, and of which Professor Moore is one of the most distinguished ornaments. In this connection it may be stated that the continued prosperity of our State Association, of which Dr. Moore was the second President, is sufficiently attested by the last excellent volume of Transactions, recently issued under the admirable editorship of Dr. Carroll; while the New York County Medical Association has never been so flourishing as at present, about a hundred new members, including many prominent physicians, having been added within the last four months.

P. B. P.

MISCELLANY.

Dr. John S. Billings and the Eleventh Census.—Through an oversight the following circular to the profession, issued by the Superintendent of the Eleventh Census, was omitted at the proper date. The attention of our readers is especially directed to the instructions contained therein: "The various medical associations and the medical profession will be glad to learn that Dr. John S. Billings, Surgeon U. S. Army, has consented to take charge of the Report on the Mortality and Vital Statistics of the United States as returned by the eleventh census. As the United States has no system of registration of vital statistics, such as is relied upon by other civilized nations for the purpose of ascertaining the actual movement of population, our census affords the only opportunity of obtaining near an approximate estimate of the birth and death rates of much the larger portion of the country, which is entirely unprovided with any satisfactory system of State and municipal registration. In view of this, the Census Office, during the month of May, this year, will issue to the medical profession throughout the country 'Physicians' Registers' for the purpose of obtaining more accurate returns of deaths than it is possible for the enumerators to make. It is earnestly hoped that physicians in every part of the country will coöperate with the Census Office in this important work. The record should be kept from June 1, 1889, to May 31, 1890. Nearly 26,000 of these registration books were filled up and returned to the office in 1880, and nearly all of them used for statistical purposes. It is hoped that double this number will be obtained for the eleventh census. Physicians not receiving registers can obtain them by sending their names and addresses to the Census Office, and, with the register, an official envelope which requires no stamp will be provided for their return to Washington. If all medical and surgical practitioners throughout the country will lend their aid, the mortality and vital statistics of the eleventh census will be more comprehensive and complete than they have ever been. Every physician should take a personal pride in having this report as full and accurate as it is possible to make it. It is hereby promised that all information obtained through this source will be held strictly confidential. Robert S. Porter, Sup't of Census.

Medical Society of Virginia.—The twentieth annual session of this Society will convene in Roanoke, Va., Tuesday, Sept. 3, 1889, at 8 P.M. Special attention is called to the following resolution adopted 1884:

"*Resolved*, That the Secretary be instructed to send out a notice to each member of the Society two months in advance of the day of meeting calling for the titles of any papers to be read before the Society—said titles to be returned to the Secretary at least five weeks before the day of session—failure in which will relegate any papers to the last day of the session; that the Secretary shall classify such titles according to subjects, and, in publishing his programme, assign all papers on or pertaining to the same classification (such as Surgery, Diseases of Women, etc.) to be read the same day, specifying the day, with a limit of one-half hour to each paper; and fifteen minutes for each discussion, unless this time is extended by a two-thirds vote of those present."

The subject for general discussion is "Croupous Pneumonia," Dr. B. L. Winston, of Hanover C. H., Va., Leader. Parties preparing papers on this subject should notify the Secretary. Circular announcement will be issued about a month hence. Send applications for Fellowship, with name and post-office in full, name of college, and date of graduation in medicine, date of passing examination successfully before Medical Examining Board of Virginia, name of a Fellow who recommends the applicant, and $2.00 initiation fee, to the Recording Secretary, Landon B. Edwards, M.D., Richmond, Va.

The Medico-Legal Society has issued the following circular:

New York, June 20, 1889.

Dear Sir:—The recent session of the International Congress of Medical Jurisprudence was successful beyond the most sanguine expectations of its promoters. It perfected a permanent organization and provided for the selection of an additional Vice-President from each State and Territory of the American Union, and from each foreign province, State and country who had members in the organization who took an interest in the success of the movement.

Future meetings were authorized to be called by the executive officers, a list of whom is herewith sent you.

The expenses of publishing all the papers read at this Congress, with a record of its transactions and the proceedings at the banquet, will fill a large volume, the expense of which it is estimated will be about $700. The executive officers were authorized to elect additional members into the organization, the only expense of which is the enrolling fee of $3, which entitles the members to the Bulletin free.

Will you unite in this movement with a view of making it International, and will you suggest a suitable name for Vice-President from your State, Territory, province

or country. If this effort is received with favor by the members of the Medico-Legal Society, active, corresponding and honorary alone, without counting others, it will at once provide for the publication of the transactions and the papers read before the Congress, and lay on firm and sure foundations the International work of promoting the advancement of medical jurisprudence, not alone in the United States of America, but throughout the civilized world.

Your coöperation in this effort is earnestly solicited in your locality, and your name will be laid before the executive officers for enrollment as a member on receipt of the enrolling fee, which can be sent to any officer of the body.

The officers elected by the Congress, held June 4 to 7, 1889, in New York, were as follows: President—Clark Bell, Esq., of New York. Vice-Presidents—Chief Justice Sir John C. Allen, of New Brunswick; Chief Justice Edward F. Bermudez, of Louisiana; Dr. Bettincourt Rodrigues, for Portugal; Gov. Biggs, of Delaware; Dr. Daniel Clark, of Toronto, Canada; Ex-Chief Justice Noah Davis, of New York; Dr. Edward J. Doering, of Illinois; Prof. John J. Elwell, of Ohio; Judge W. H. Francis, of Dakota Ter.; Dr. W. W. Gedding, of Washington, D. C.; Dr. Eugene Grissom, of North Carolina; Dr. Carl H. Horsch, of New Hampshire; Judge Locke E. Houston, of Mississippi; Dr. Charles H. Hughes, of Missouri; Dr. W. W. Ireland, of Scotland; Prof. Robt. C. Kedzie, of Michigan; Dr. Norman Kerr, of England; Dr. Jules Morel, of Belgium; Dr. Jennie McCowen, of Iowa; Dr. Connolly Norman, of Ireland; Prof. John J. Reese, of Pennsylvania; Judge H. M. Somerville, of Alabama; David Stewart, Esq., of Maryland; Theo. H. Tyndale, Esq., of Massachusetts. Secretary—Moritz Ellinger, Esq., of New York. Assistant Secretaries—Dr. Frank H. Ingram, of New York; Dr. Wm. J. Lewis, of Connecticut; J. F. Walters, of New York.

The President was empowered and directed by the Congress to appoint additional Vice-Presidents for the various States, Territories, provinces and countries, which will be done during the summer vacation. Members of the Congress receiving this circular, who have not sent their enrolling fee, will please do so, and circulate this among those who take an interest in the science.

Your early response is requested to either of the undersigned. CLARK BELL, President,

MORITZ ELLINGER, 57 Broadway, New York.
Surrogate's Office, New York City.

MISSISSIPPI VALLEY MEDICAL ASSOCIATION.—At a meeting of the General Committee, at Newport, it was decided to change the date of meeting of this Association to September 10, 11, and 12, 1889. This promises to be the largest and most interesting meeting in the history of this Association. A large attendance of representative men from all parts of the United States has been assured.

LETTERS RECEIVED.

Dr. O. D. Haven, Allegheny, Pa.; Dr. Henry W. Elmer, Bridgeton, N. J.; E. M. DePuy, Washington; Dr. S. L. Holley, Nanticoke, Pa.; Dr. C. Park, Oquakee, Ill.; Dr. F. B. Schulz, Cape Girardeau, Mo.; Jerome Kidder Mfg. Co., New York, Dr. C. A. Harvey, New York; Dr. Richard J. Dunglison, Philadelphia; Dr. J. A. Dibrell, Jr., Little Rock, Ark.; Dr. W. N. Miller, Pittsburgh, Pa.; Dr. Charles Disen, Minneapolis, Minn.; Dr. W. VanHook, Chicago; Dr. I. B. Ellis, Bethany, Mo.; Malted Milk Co., Racine, Wis.; Dr. James E. Morgan, Washington; Dr. Wm. C. Dabney, White Sulphur Springs, Ky.; Dr. Joseph Price, Philadelphia; Dr. N. P. Dandridge, Cincinnati, O.; W. L. Minter, Louisville, Ky.; Medical Herald Co., St. Joseph, Mo.; Dr. G. K. Dickinson, Jersey City, N. J.; J. F. Widman, McGregor, Ia.; Dr. J. F. Page, Powersville, Mo.; Dr. Thos. Cosgrove, Auburndale, O.; Dr. F. G. Albright, Lancaster, Pa.; Dr. W. H. Landis, Woodland, Mich.; Dr. G. W. H. Kemper, Muncie, Ind.; Dr. Horace M. Starkey, Chicago; Dr. J. C. Hoag, Chicago; Galvano Faradic Mfg. Co., New York; Dr. G. R. Wells, Gold Hill, Col.; Dr. A. L. Hummel, Philadelphia; Dr. J. W. Long, Bryan, O.; Dr. J. T. Jelks, Hot Springs, Ark.; Dr. A. P. Brown, Fort Worth, Tex.; Dr. Joseph Eastman, Indianapolis, Ind.; Dr. David Barrow, Lexington, Ky.; Dr. J. B. Murdoch, Pittsburgh, Pa.; G. H. Mitchell & Co., Cedar Rapids, Ia.; Dr. W. T. Lusk, Brooklyn, N. Y.; Dr. A. M. Owen, Evansville, Ind.; Fred. D. Van Horen, New York; Dr. Gersham H. Hill, Independence, Ia.; Dr. H. R. Storer, Newport, R. I.; Dr. Albert F. Stifel, Wheeling, W. Va.; Dr. W. I. Haddens, St. Joseph, Mo.; Publishers' Commercial Union, Chicago; Dr. A. R. Stewart, Toledo, O.; Dr. J. G. Truax, New York; Dr. G. F. Smolt, Nickerson, Kan.; Dr. J. W. Muenich, Jefferson, Wis.

Official List of Changes in the Stations and Duties of Officers Serving in the Medical Department, U. S. Army, from July 6, 1889, to July 12, 1889.

By direction of the acting Secretary of War, the retirement from active service this date, by operation of law, of Col. Thomas A. McParlin, Surgeon, under the provisions of the Act of Congress approved June 30, 1882, is announced. Col. McParlin will repair to his home. Par. 2, S. O. 157, A. G. O., July 10, 1889.

Major H. O. Perley, Asst. Surgeon U. S. Army, is ordered to accompany troops from Ft. Wayne, Mich., to Gognac Lake, Mich., to encamp there with the Michigan State troops from August 8 to 13, 1889. Par. 1, S. O. 154, Hdqrs. Div. of the Atlantic, July 9, 1889.

Capt. H. O. Perley, Asst. Surgeon U. S. Army, is granted fourteen days' leave of absence, to commence about July 14, 1889. Par. 2, S. O. 154, Hdqrs. Div. of the Atlantic, July 14, 1889.

Col. Andrew K. Smith, Surgeon U. S. Army, promoted to Surgeon with rank of Colonel, to rank from July 10, 1889. Vice McParlin, retired.

Lieut.-Col. Francis L. Town, Surgeon U. S. Army, promoted Surgeon, wtth rank of Lieut-Colonel, to rank from July 10, 1889. Vice A. K. Smith, promoted.

Capt. W. C. Gorgas, Asst. Surgeon, is granted leave of absence for one month, to take effect on the arrival of a medical officer to relieve him. Par. 2, S. O. 84, Hdqrs. Dept. of the Missouri, July 3, 1889.

By direction of the Secretary of War, Capt. Andrew V. Cherbonnier, Medical Storekeeper, will, in addition to his present duties, take charge of the office and perform the duties of acting Assistant Medical Purveyor in St. Louis, Mo., during the absence of Capt. George T. Beall, Medical Storekeeper. Par. 2, S. O. 151, A. G. O., July 2, 1889.

Official List of Changes in the Medical Corps of the U. S. Navy for the Week Ending July 13, 1889.

Asst. Surgeon S. Stuart White, ordered to the Naval Hospital, Brooklyn, N. Y.

Medical Inspector C. H. White, detached from the "Trenton" and wait orders.

P. A. Surgeon Ernest Norfleet, detached from the "Trenton," and to the "Monocacy."

P. A. Surgeon H. E. Ames, detached from the "Monocacy, proceed home and wait orders.

Surgeon G. E. H. Harmon, detached from the "Constellation" and to the Naval Academy.

Asst. Surgeon C. H. T. Lowndes, detached from the "Constellation" and to the Naval Academy.

Surgeon H. P. Harvey, detached from the "Vandalia" July 7, proceed home and wait orders.

Asst. Surgeon S. Stuart White, detached from the "Trenton July 7, 1889.